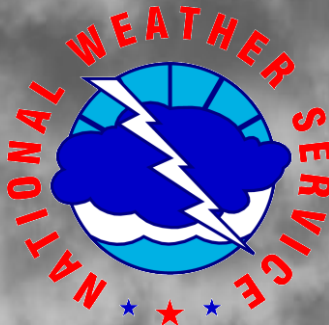
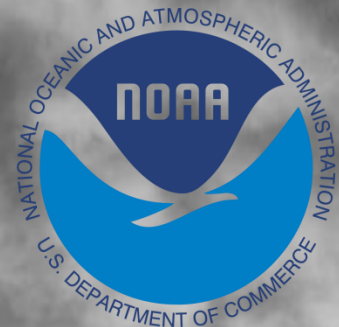


SKYWARN Basic Spotter Training

**Gerald Satterwhite
Meteorologist**

**U.S. Department of Commerce
National Oceanic and Atmospheric Administration (NOAA)
National Weather Service (NWS) – Calera, AL**





Welcome to Basic Spotter Training

This course focuses on:

- Identifying, assessing, and reporting severe weather
- Simple thunderstorm type and characteristics information

After completing this course, you may register for the 'advanced' course. A more in-depth look at:

- Development processes and ingredients
 - Severe thunderstorm forecasting
 - Inspecting radar and satellite imagery.

Advanced course scheduled for Tuesday, March 07th at 6:30PM

Spotter Training Agenda

Part I

- Who we are, and why we need spotters?
 - Severe weather definitions
 - What and how to report
 - Safety in storm spotting
- Break--

Part II

- Thunderstorm development and thunderstorm types
 - Mesocyclone
- Wall Clouds vs. Shelf Clouds; Scud Clouds and Tail Clouds
 - Tornado formation
- Report what you see; photo polls
- Spotter information recap; polls

Disclaimer

This is not storm chaser training!

The National Weather Service encourages everyone, at all times, to seek shelter when threatened by hazardous weather!

Spotter Training Agenda

Part I

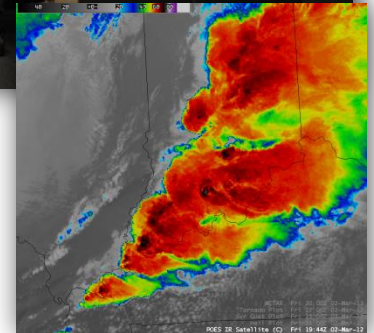
- **Who we are, and why we need spotters?**
 - Severe weather definitions
 - What and how to report
 - Safety in storm spotting
- Break--

Part II

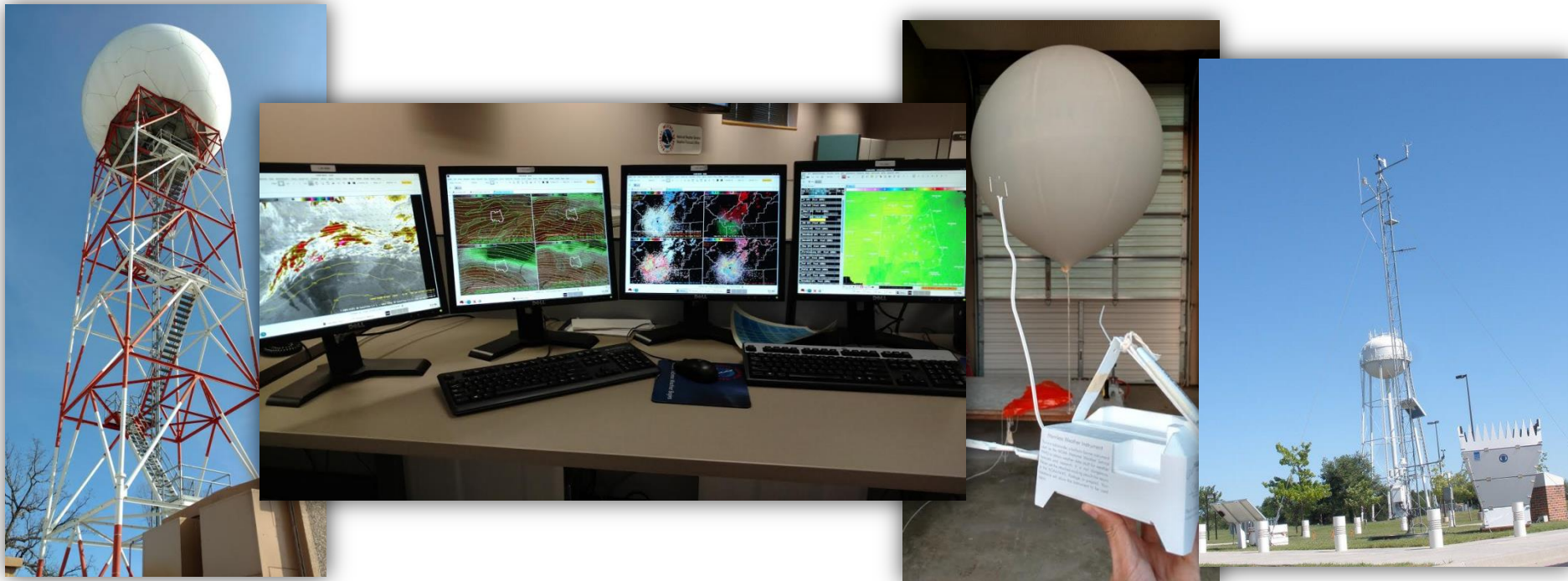
- Thunderstorm development and thunderstorm types
 - Mesocyclone
- Wall Clouds vs. Shelf Clouds; Scud Clouds and Tail Clouds
 - Tornado formation
- Report what you see; photo polls
- Spotter information recap; polls

Who is the National Weather Service?

- A team of forecasters, electronic and computer technicians
- We constantly evaluate the atmosphere, gather and disseminate data
- Issue forecasts; watches, warnings, and advisories
- We work with media to communicate weather information to you
- We work with emergency managers to help communities prepare and respond to severe weather



Why Are We Here?



Protect Life and Property

Help you make informed decisions

Alabama NWS Offices

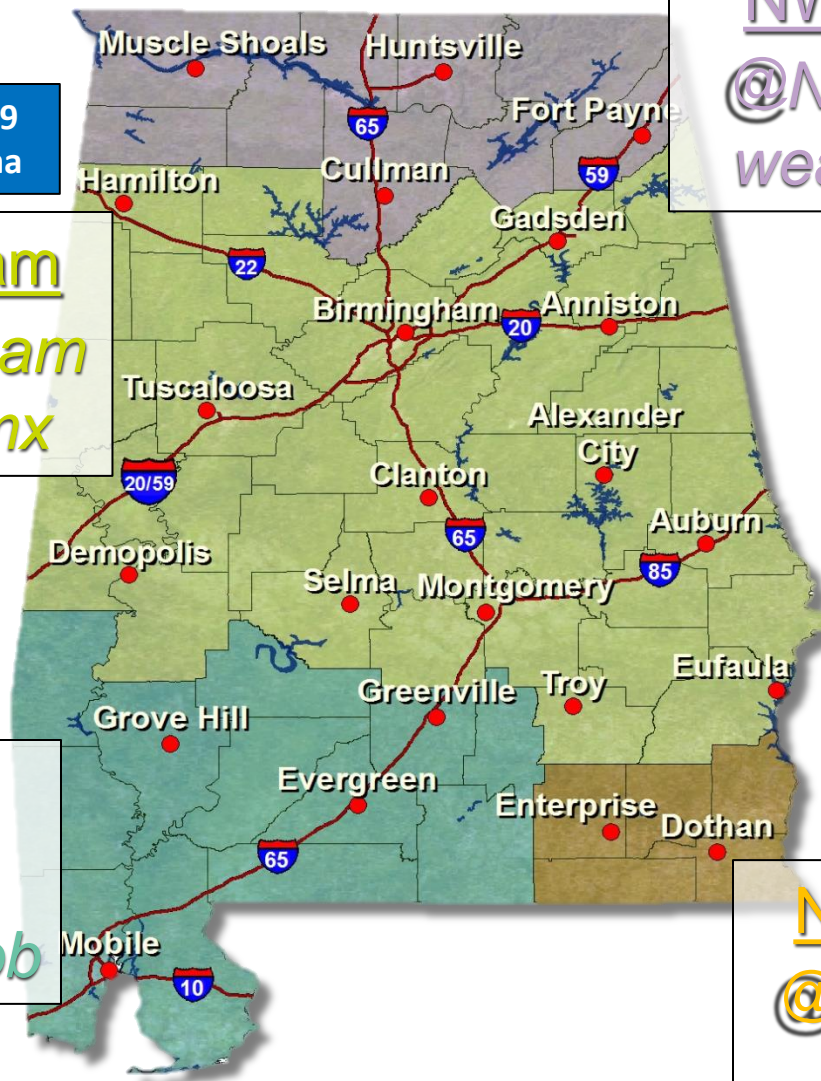
NWS Birmingham Serves 39
Counties in Central Alabama

NWS Birmingham
[@NWSBirmingham](#)
weather.gov/bmx

NWS Mobile
[@NWSMobile](#)
weather.gov/mob

NWS Huntsville
[@NWSHuntsville](#)
weather.gov/hun

NWS Tallahassee
[@NWS Tallahassee](#)
weather.gov/tae



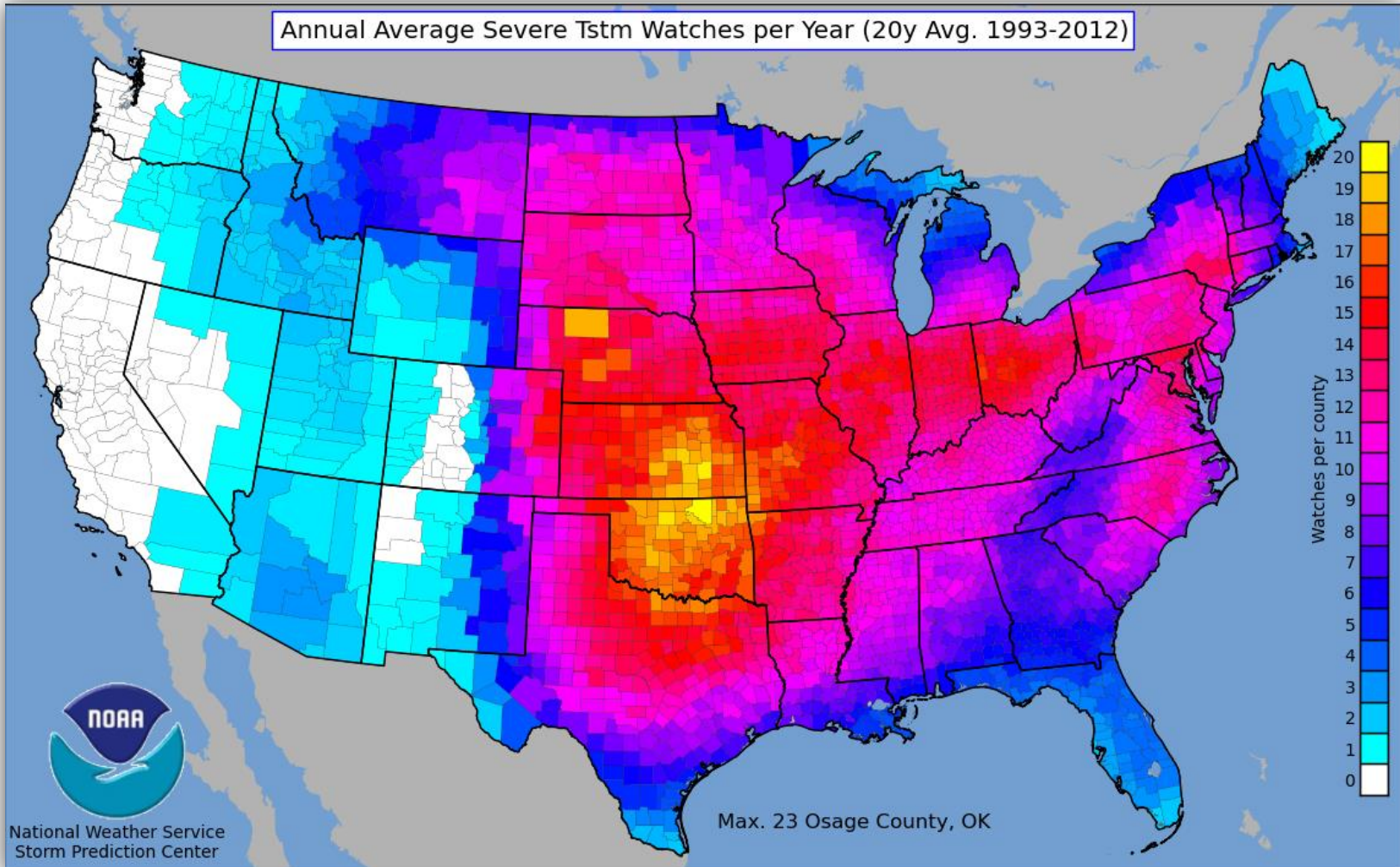
Why We Need Spotters (you)?

- Ground truth!
 - Real-time verification
 - Reports add credibility and increase public response

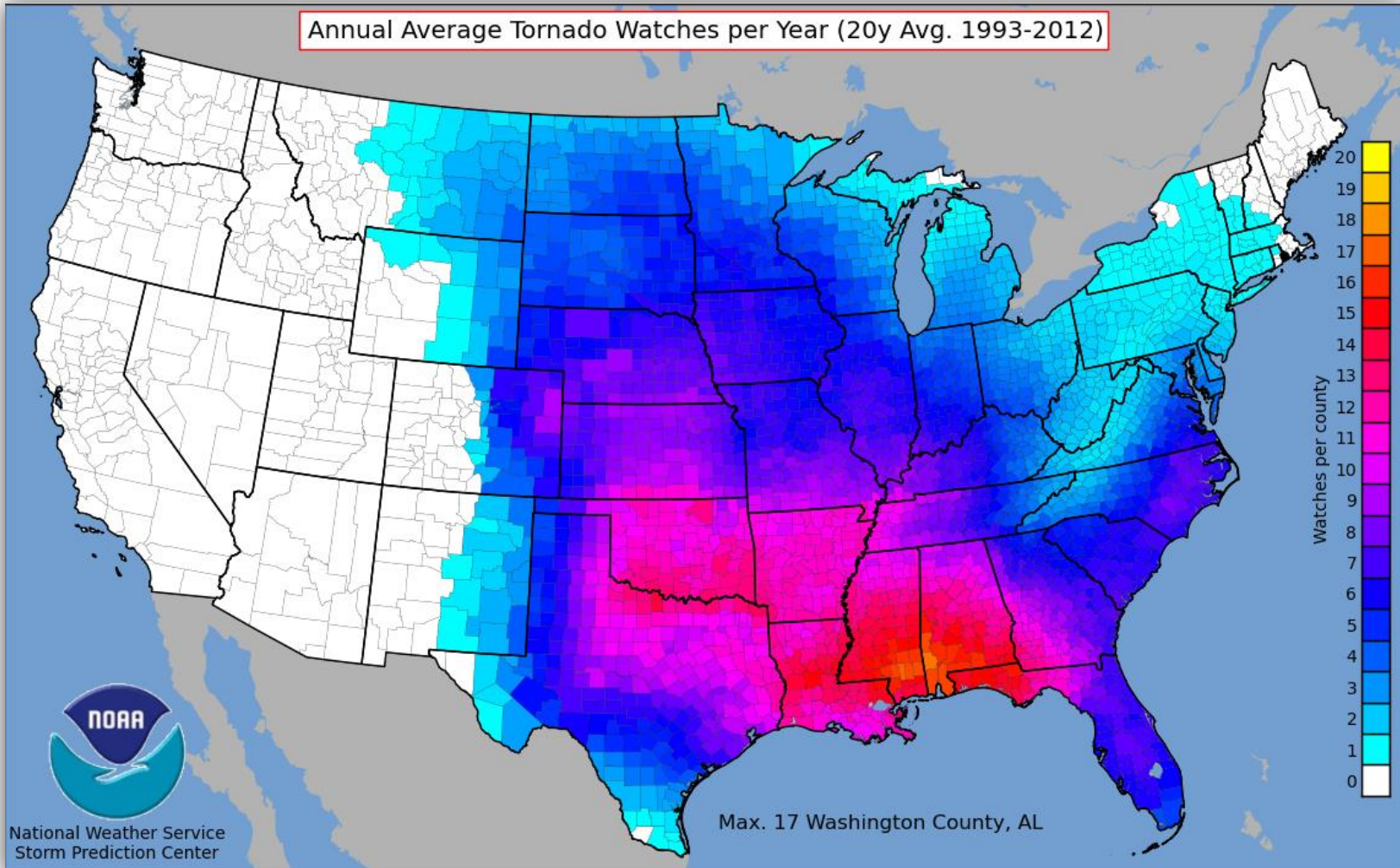


20-Year SPC Watch Climatology

Severe Thunderstorm

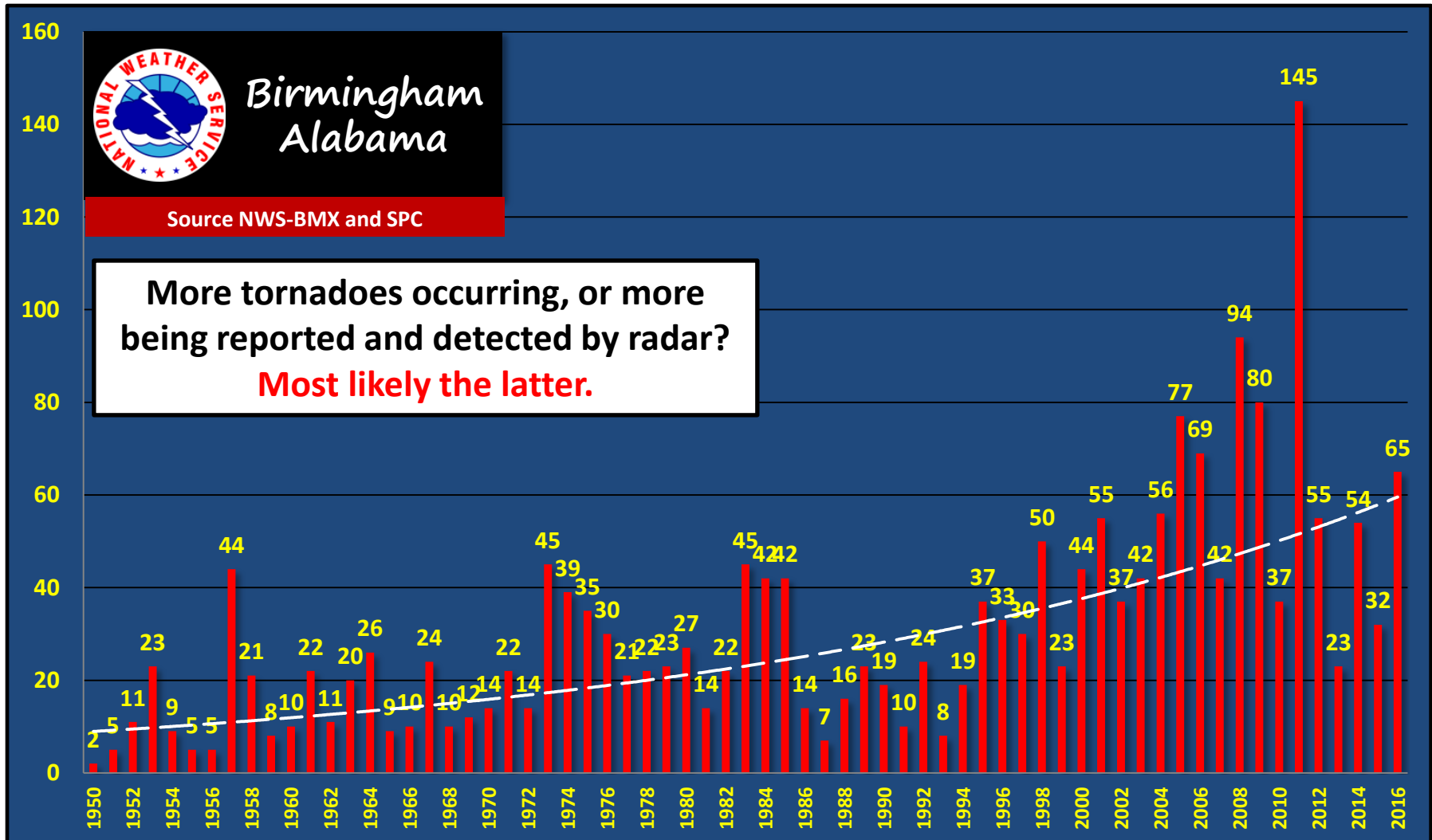


20-Year SPC Watch Climatology Tornado



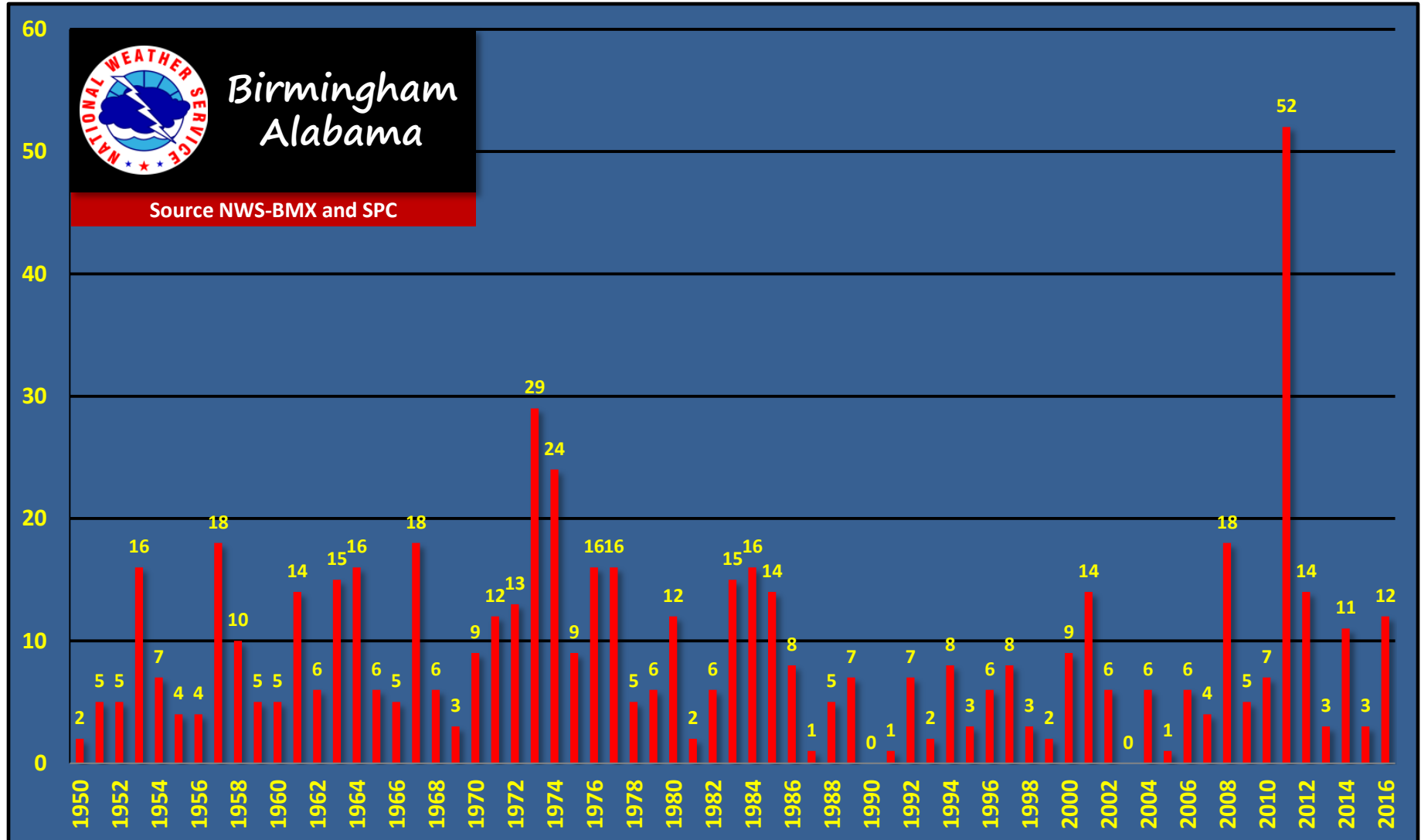
Alabama Tornadoes

Year 1950-2016

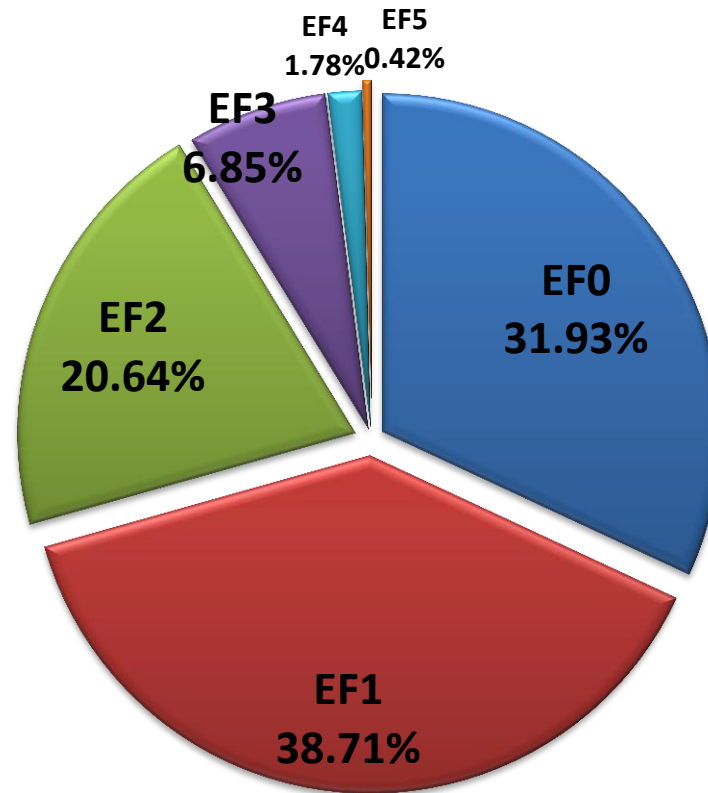
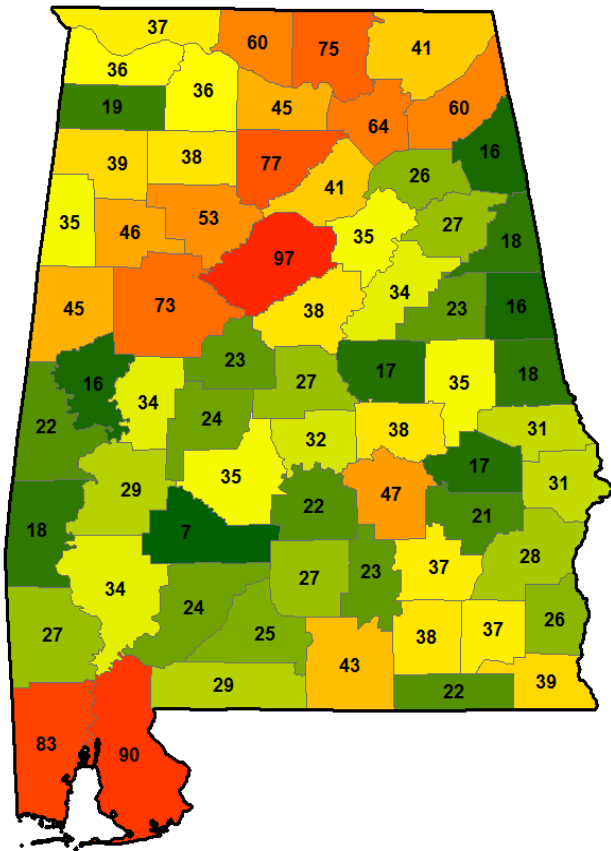


Alabama Tornadoes

EF2 or Stronger by Year 1950-2016



Alabama Tornadoes by County and Percent EF-scale 1950-2016



Rating	Winds
EF0	65-85 mph
EF1	86-110 mph
EF2	111-135 mph
EF3	136-165 mph
EF4	166-200 mph
EF5	> 200 mph

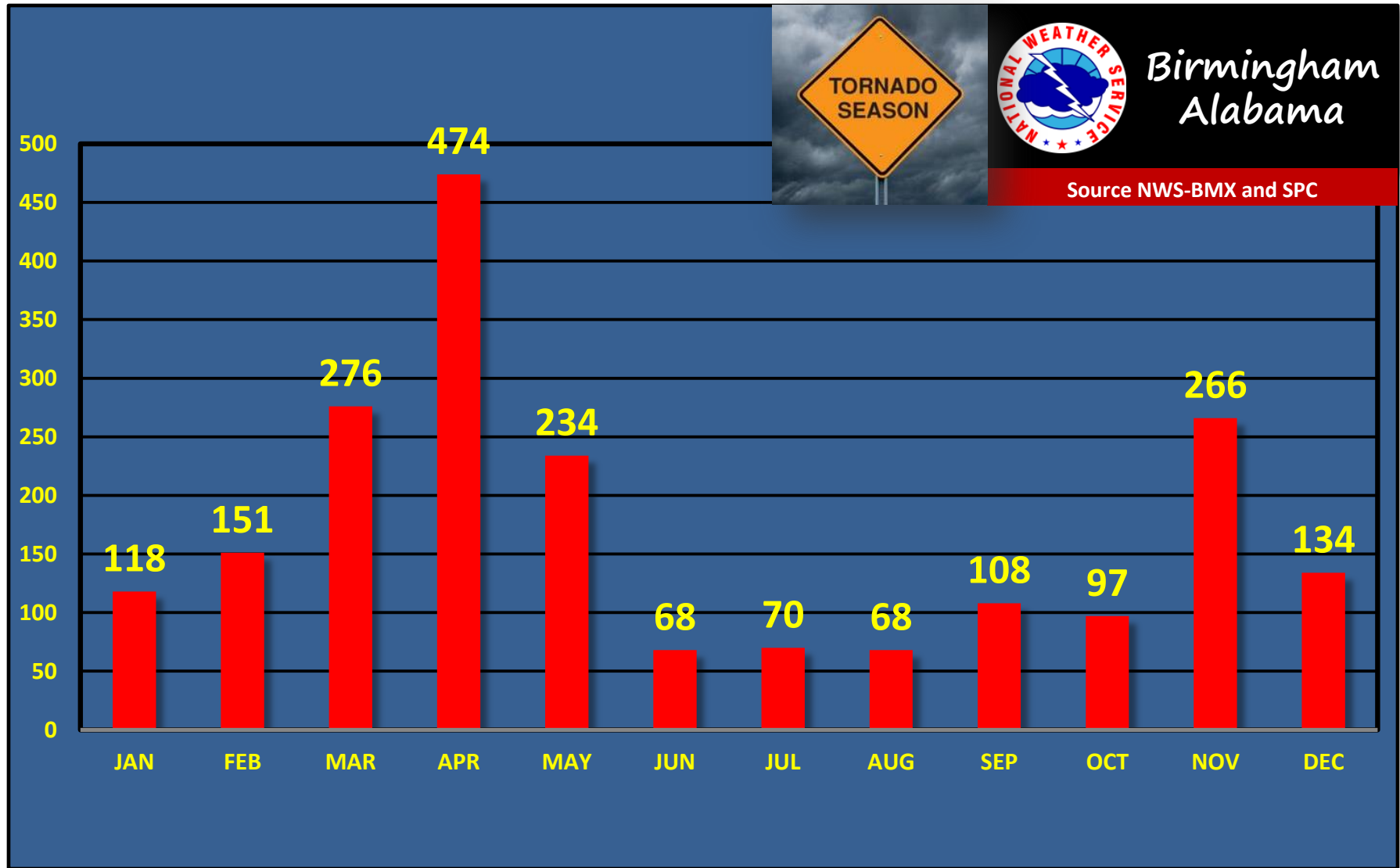
Source NWS-BMX and SPC



Birmingham
Alabama

Alabama Tornadoes by Month

1950-2016

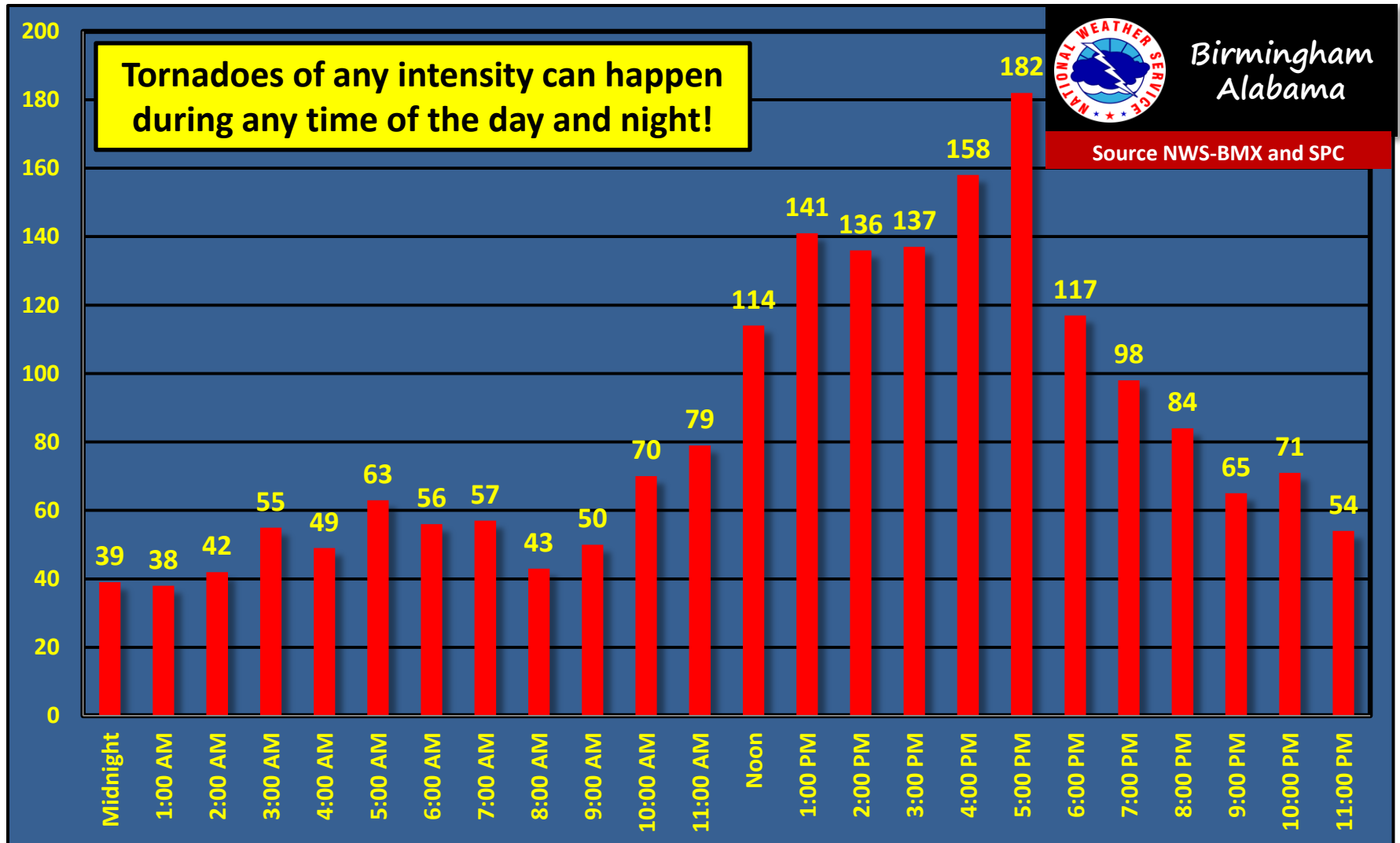


Alabama Tornadoes by Hour

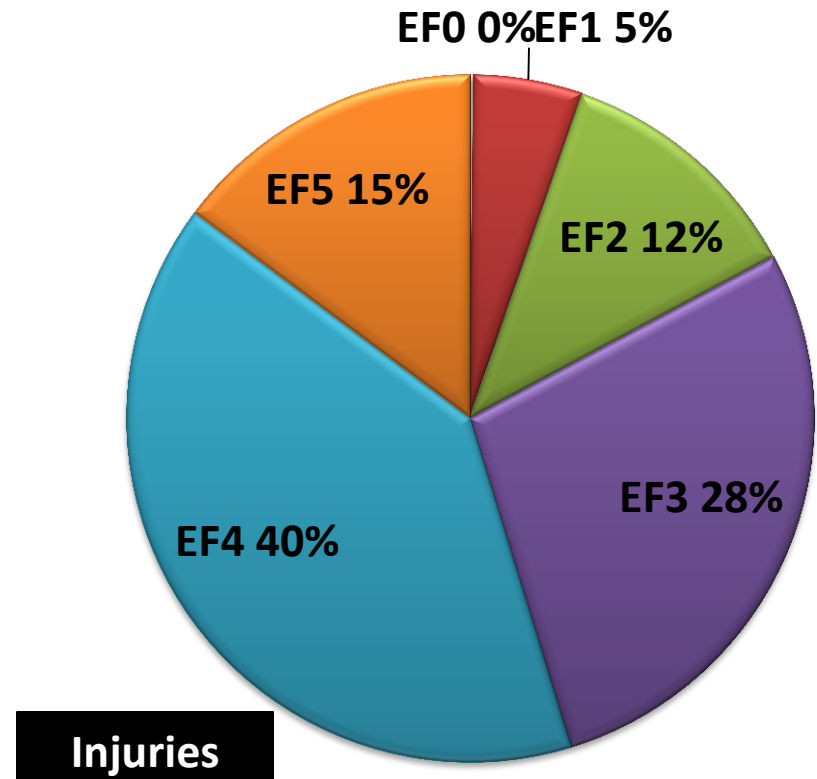
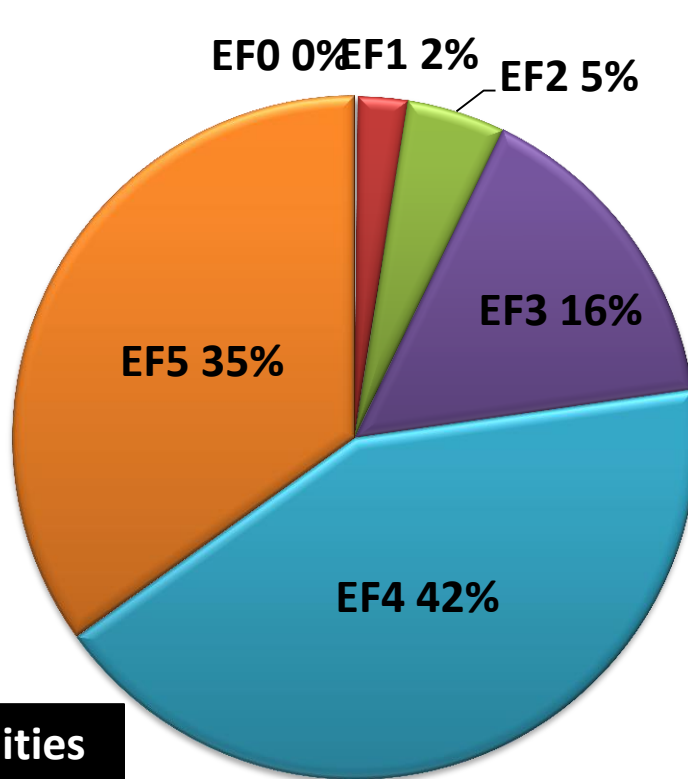
1950-2016



15



Alabama Tornadoes Injuries and Fatalities by Tornado Intensity 1950-2016



Majority of injuries and fatalities occur with violent (EF4-EF5) tornadoes, though they are least common (combined 2.2% of all tornadoes in Alabama) . **Sheltering matters!**



Birmingham
Alabama

Considering all of these Storms, how do we Detect Severe Weather?



NOAA Blueprints

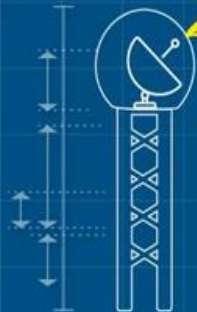
WSR-88D Weather Surveillance (Doppler) Radar

Electronics technicians maintain and calibrate the radar. Meteorologists set the scanning strategy based on weather type.

NWS Weather Forecast Office

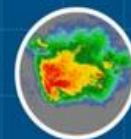
10 cm electromagnetic waves are transmitted at the speed of light in the form of short bursts of radio waves.

WSR-88D



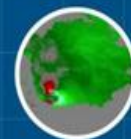
These radio waves strike hydrometeors, such as **rain**, **hail** or **snow** in the atmosphere and the wave energy is scattered in all directions. Some energy is reflected back toward the radar where a finely tuned receiver measures the amount of energy returned and whether rain/hail/snow is moving toward or away from the radar - know as the Doppler Shift.

What can the radar tell us?



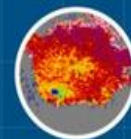
Reflectivity

Where the rain, hail and snow is located in a thunderstorm or in other weather systems.



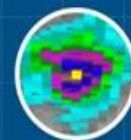
Velocity

Detects changes in the wind inside of thunderstorms. This is used to help determine where tornadoes are forming.



Dual-Polarization

Can be used to determine the shape of hydrometeors or other objects in the atmosphere, such as rain, hail, snow and even debris.



Precipitation

Very good at estimating how much rain has fallen in an area.

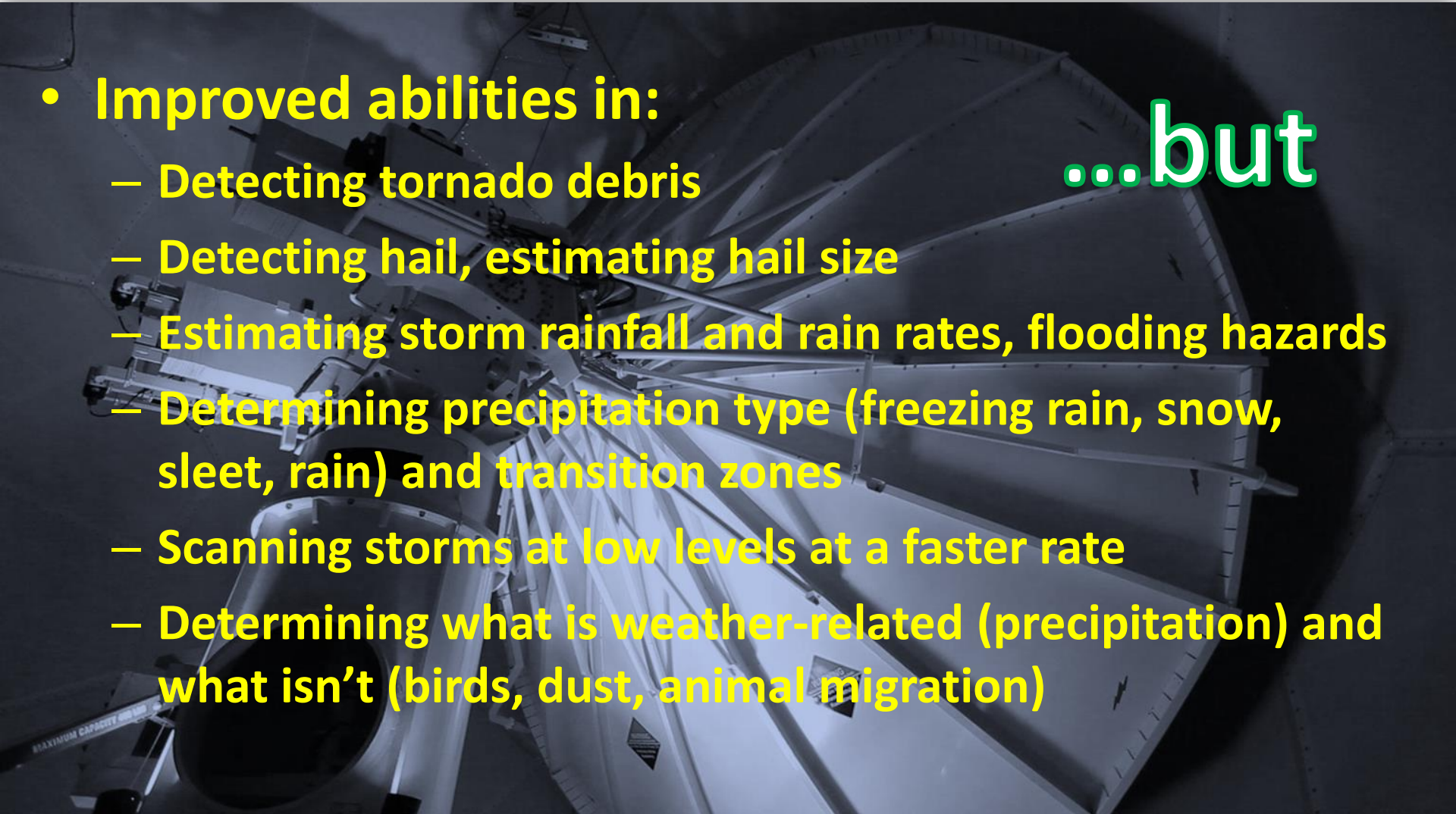
How do we Detect Severe Weather?

Recent advancements in radar technology

- Improved abilities in:

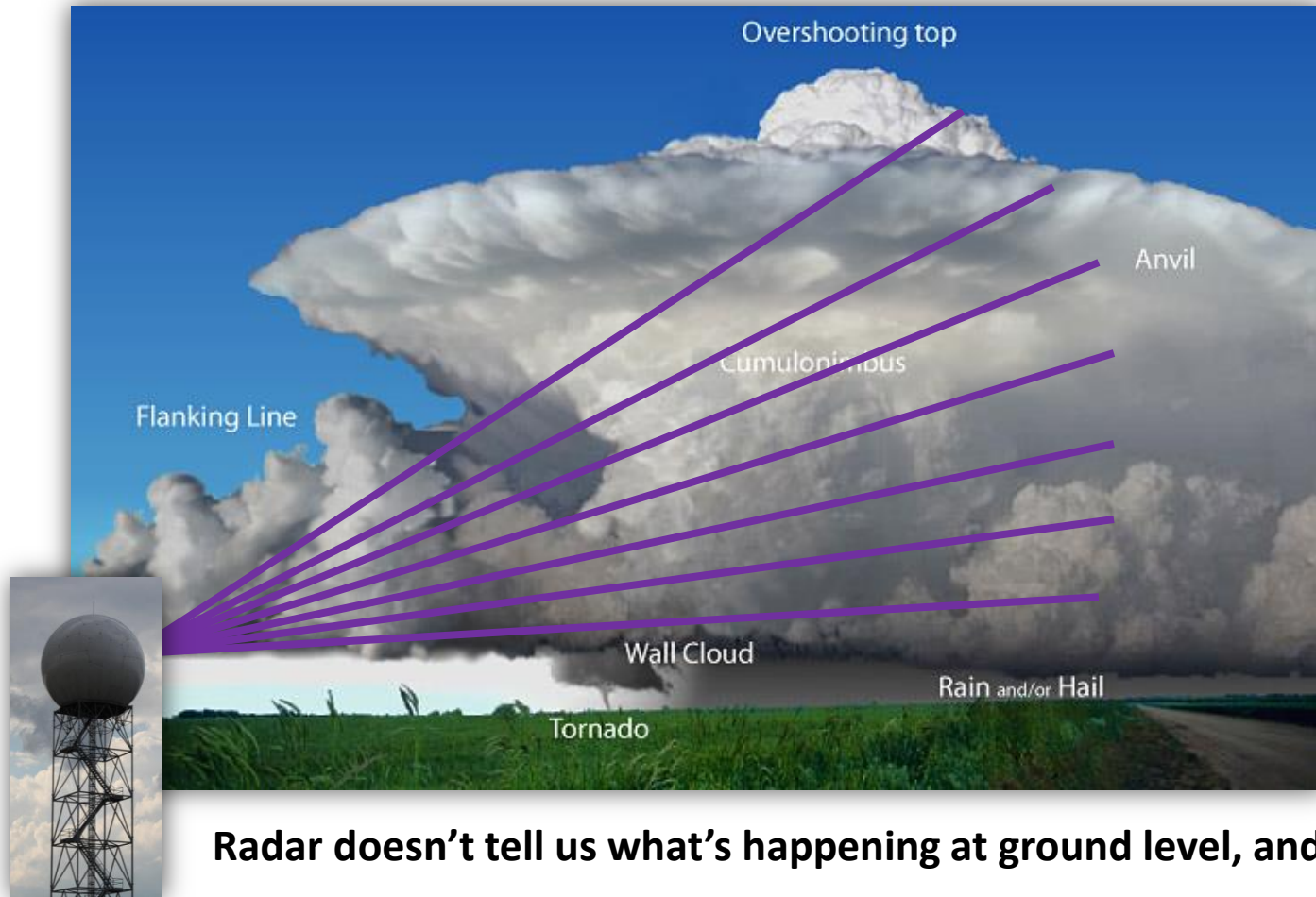
- Detecting tornado debris
- Detecting hail, estimating hail size
- Estimating storm rainfall and rain rates, flooding hazards
- Determining precipitation type (freezing rain, snow, sleet, rain) and transition zones
- Scanning storms at low levels at a faster rate
- Determining what is weather-related (precipitation) and what isn't (birds, dust, animal migration)

...but



What about Below the Radar Beam?

Spotters Help Tell the Story



Radar doesn't tell us what's happening at ground level, and

...with increasing distance from the radar, it can become even more difficult to completely assess the storm.

What about Below the Radar Beam?

Spotters Help Tell the Story



Radar tells us the storm is capable of producing strong winds, hail, and/or a tornado

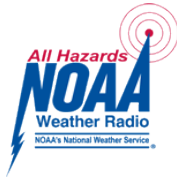
Spotters help confirm if the storm is producing damaging winds, hail, and/or a tornado

Spotters Principles

- **Personal safety is the primary objective of every spotter**
- **Adhere to the concept of ACES at all times**
Awareness-Communication-Escape Route-Shelter
- **Obey federal, state, and local laws; directives from public safety officials**
- **Never put yourself in harm's way**
- **Remain aware of the weather situation around you!**

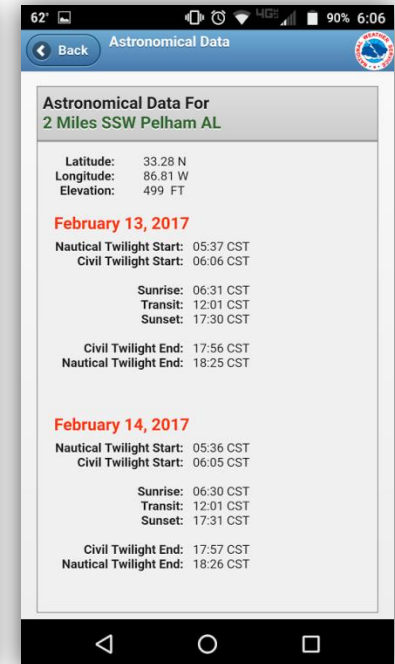
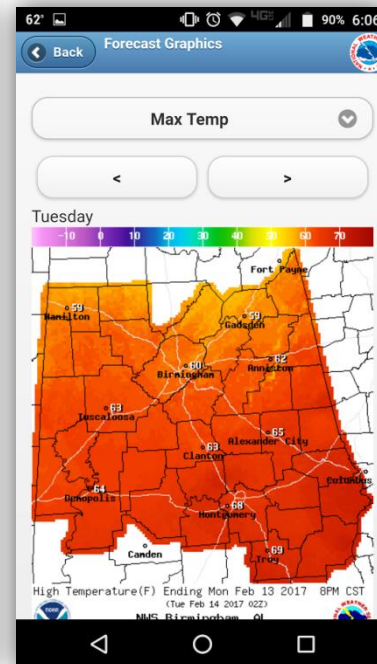
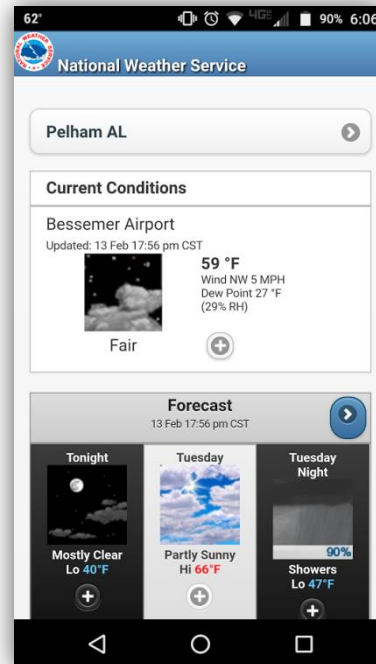
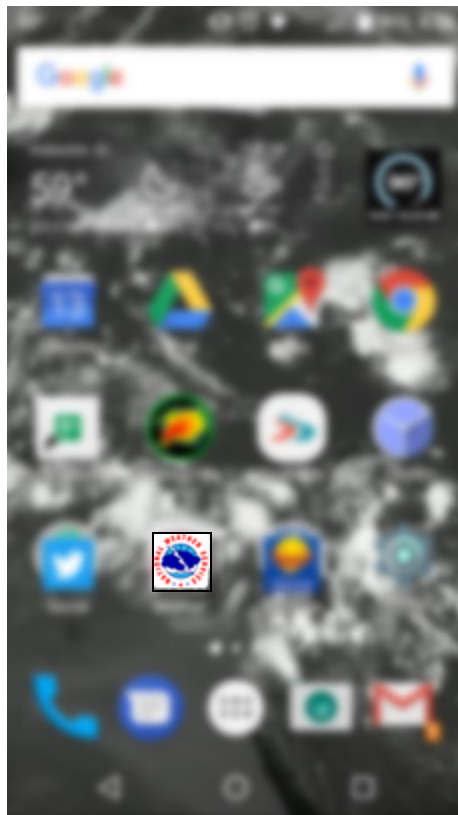


How to Get Weather Information



No NWS App., but We Have a Widget

Google 'NWS Widget' and select the first link at the top. Enter your ZIP Code, or use current location. Save the widget as a bookmark to your home screen.



10 Weather Radio Transmitters in Central Alabama

The fastest way to receive our watches and warnings! Will interrupt regular 24/7 broadcast with tone alerts.

Alerts will wake you at night/when sleeping!

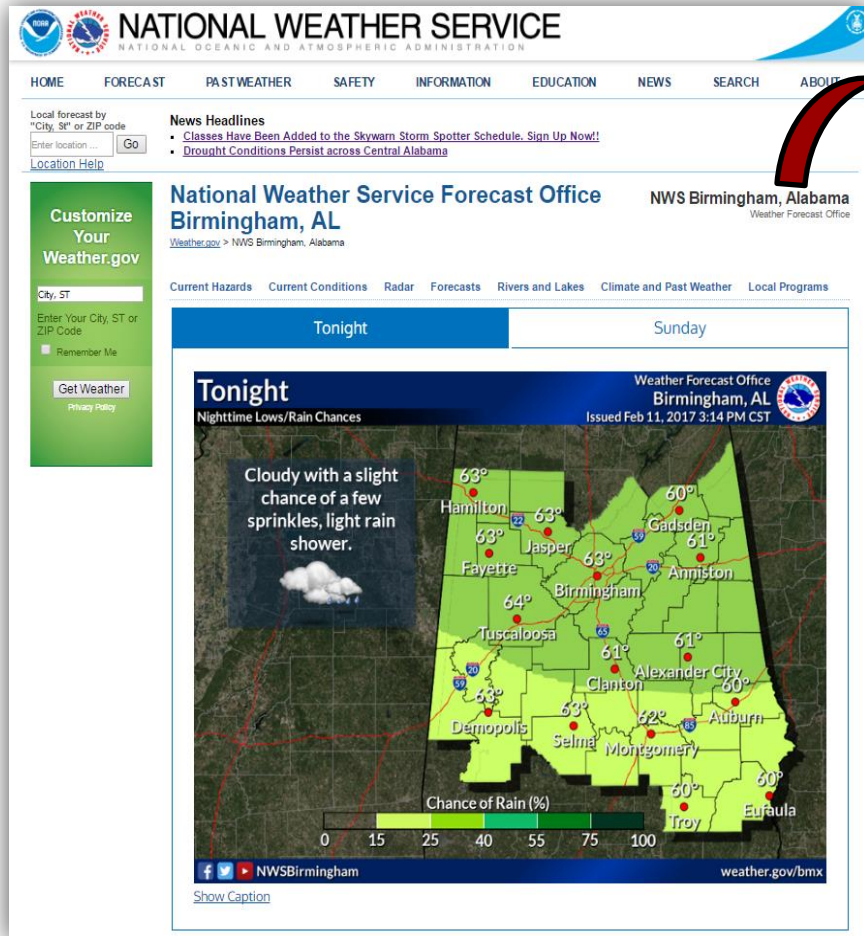
SAME (Specific Area Message Encoding) technology lets you decide which locations to receive warnings for.

Weather radio information available on our webpage, click the 'Wx Radio' button at the bottom of the page.



Our Webpage

weather.gov/bmx



NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION NEWS SEARCH ABOUT

Local forecast by "City, ST" or ZIP code
Enter location ... Go
[Location Help](#)

News Headlines

- Classes Have Been Added to the Skywarn Storm Spotter Schedule. Sign Up Now!
- Drought Conditions Persist across Central Alabama

National Weather Service Forecast Office Birmingham, AL
[Weather.gov > NWS Birmingham, Alabama](#)

NWS Birmingham, Alabama
Weather Forecast Office

Customize Your Weather.gov

City, ST
Enter Your City, ST or ZIP Code
Remember Me
Get Weather
Privacy Policy

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate and Past Weather Local Programs

Tonight Sunday

Tonight
Nighttime Lows/Rain Chances
Weather Forecast Office Birmingham, AL
Issued Feb 11, 2017 3:14 PM CST

Cloudy with a slight chance of a few sprinkles, light rain shower.

Map showing temperatures and rain chances across Alabama:

- Hamilton: 63°
- Jasper: 63°
- Fayette: 64°
- Birmingham: 63°
- Gadsden: 60°
- Anniston: 61°
- Tuscaloosa: 61°
- Alexander City: 61°
- Clanton: 63°
- Demopolis: 63°
- Selma: 62°
- Montgomery: 62°
- Auburn: 60°
- Troy: 60°
- Eufaula: 60°


Chance of Rain (%)

0 15 25 40 55 75 100

[Show Caption](#)

[NWSBirmingham](#) [weather.gov/bmx](#)

Click a location below for detailed forecast.



Watches, Warnings & Advisories
Flood Warning
Hazardous Weather Outlook

Last Map Update: Sat, Feb. 11, 2017 at 5:57:08 pm CST

[Local Radar](#) [Weather Map](#)

National Weather Service Birmingham Hazardous Weather Outlook
ISSUED: 11:00 AM Saturday, February 11, 2017
EXPIRES: 11:00 AM Sunday, February 12, 2017

Confidence Factor: Low Medium High Very High

Text Product Selector (Selected product opens in current window)

Choose a Text Product

Grids: 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72 75 78 81 84 87 90 93 96 99 102 105 108 111 114 117 120 123 126 129 132 135 138 141 144 147 150 153 156 159 162 165 168 171 174 177 180 183 186 189 192 195 198 201 204 207 210 213 216 219 222 225 228 231 234 237 240 243 246 249 252 255 258 261 264 267 270 273 276 279 282 285 288 291 294 297 300 303 306 309 312 315 318 321 324 327 330 333 336 339 342 345 348 351 354 357 360 363 366 369 372 375 378 381 384 387 390 393 396 399 402 405 408 411 414 417 420 423 426 429 432 435 438 441 444 447 450 453 456 459 462 465 468 471 474 477 480 483 486 489 492 495 498 501 504 507 510 513 516 519 522 525 528 531 534 537 540 543 546 549 552 555 558 561 564 567 570 573 576 579 582 585 588 591 594 597 600 603 606 609 612 615 618 621 624 627 630 633 636 639 642 645 648 651 654 657 660 663 666 669 672 675 678 681 684 687 690 693 696 699 702 705 708 711 714 717 720 723 726 729 732 735 738 741 744 747 750 753 756 759 762 765 768 771 774 777 780 783 786 789 792 795 798 801 804 807 810 813 816 819 822 825 828 831 834 837 840 843 846 849 852 855 858 861 864 867 870 873 876 879 882 885 888 891 894 897 900 903 906 909 912 915 918 921 924 927 930 933 936 939 942 945 948 951 954 957 960 963 966 969 972 975 978 981 984 987 990 993 996 999 1002 1005 1008 1011 1014 1017 1020 1023 1026 1029 1032 1035 1038 1041 1044 1047 1050 1053 1056 1059 1062 1065 1068 1071 1074 1077 1080 1083 1086 1089 1092 1095 1098 1101 1104 1107 1110 1113 1116 1119 1122 1125 1128 1131 1134 1137 1140 1143 1146 1149 1152 1155 1158 1161 1164 1167 1170 1173 1176 1179 1182 1185 1188 1191 1194 1197 1200 1203 1206 1209 1212 1215 1218 1221 1224 1227 1230 1233 1236 1239 1242 1245 1248 1251 1254 1257 1260 1263 1266 1269 1272 1275 1278 1281 1284 1287 1290 1293 1296 1299 1302 1305 1308 1311 1314 1317 1320 1323 1326 1329 1332 1335 1338 1341 1344 1347 1350 1353 1356 1359 1362 1365 1368 1371 1374 1377 1380 1383 1386 1389 1392 1395 1398 1401 1404 1407 1410 1413 1416 1419 1422 1425 1428 1431 1434 1437 1440 1443 1446 1449 1452 1455 1458 1461 1464 1467 1470 1473 1476 1479 1482 1485 1488 1491 1494 1497 1500 1503 1506 1509 1512 1515 1518 1521 1524 1527 1530 1533 1536 1539 1542 1545 1548 1551 1554 1557 1560 1563 1566 1569 1572 1575 1578 1581 1584 1587 1590 1593 1596 1599 1602 1605 1608 1611 1614 1617 1620 1623 1626 1629 1632 1635 1638 1641 1644 1647 1650 1653 1656 1659 1662 1665 1668 1671 1674 1677 1680 1683 1686 1689 1692 1695 1698 1701 1704 1707 1710 1713 1716 1719 1722 1725 1728 1731 1734 1737 1740 1743 1746 1749 1752 1755 1758 1761 1764 1767 1770 1773 1776 1779 1782 1785 1788 1791 1794 1797 1800 1803 1806 1809 1812 1815 1818 1821 1824 1827 1830 1833 1836 1839 1842 1845 1848 1851 1854 1857 1860 1863 1866 1869 1872 1875 1878 1881 1884 1887 1890 1893 1896 1899 1902 1905 1908 1911 1914 1917 1920 1923 1926 1929 1932 1935 1938 1941 1944 1947 1950 1953 1956 1959 1962 1965 1968 1971 1974 1977 1980 1983 1986 1989 1992 1995 1998 2001 2004 2007 2010 2013 2016 2019 2022 2025 2028 2031 2034 2037 2040 2043 2046 2049 2052 2055 2058 2061 2064 2067 2070 2073 2076 2079 2082 2085 2088 2091 2094 2097 2100 2103 2106 2109 2112 2115 2118 2121 2124 2127 2130 2133 2136 2139 2142 2145 2148 2151 2154 2157 2160 2163 2166 2169 2172 2175 2178 2181 2184 2187 2190 2193 2196 2199 2202 2205 2208 2211 2214 2217 2220 2223 2226 2229 2232 2235 2238 2241 2244 2247 2250 2253 2256 2259 2262 2265 2268 2271 2274 2277 2280 2283 2286 2289 2292 2295 2298 2301 2304 2307 2310 2313 2316 2319 2322 2325 2328 2331 2334 2337 2340 2343 2346 2349 2352 2355 2358 2361 2364 2367 2370 2373 2376 2379 2382 2385 2388 2391 2394 2397 2400 2403 2406 2409 2412 2415 2418 2421 2424 2427 2430 2433 2436 2439 2442 2445 2448 2451 2454 2457 2460 2463 2466 2469 2472 2475 2478 2481 2484 2487 2490 2493 2496 2499 2502 2505 2508 2511 2514 2517 2520 2523 2526 2529 2532 2535 2538 2541 2544 2547 2550 2553 2556 2559 2562 2565 2568 2571 2574 2577 2580 2583 2586 2589 2592 2595 2598 2601 2604 2607 2610 2613 2616 2619 2622 2625 2628 2631 2634 2637 2640 2643 2646 2649 2652 2655 2658 2661 2664 2667 2670 2673 2676 2679 2682 2685 2688 2691 2694 2697 2700 2703 2706 2709 2712 2715 2718 2721 2724 2727 2730 2733 2736 2739 2742 2745 2748 2751 2754 2757 2760 2763 2766 2769 2772 2775 2778 2781 2784 2787 2790 2793 2796 2799 2802 2805 2808 2811 2814 2817 2820 2823 2826 2829 2832 2835 2838 2841 2844 2847 2850 2853 2856 2859 2862 2865 2868 2871 2874 2877 2880 2883 2886 2889 2892 2895 2898 2901 2904 2907 2910 2913 2916 2919 2922 2925 2928 2931 2934 2937 2940 2943 2946 2949 2952 2955 2958 2961 2964 2967 2970 2973 2976 2979 2982 2985 2988 2991 2994 2997 3000 3003 3006 3009 3012 3015 3018 3021 3024 3027 3030 3033 3036 3039 3042 3045 3048 3051 3054 3057 3060 3063 3066 3069 3072 3075 3078 3081 3084 3087 3090 3093 3096 3099 3102 3105 3108 3111 3114 3117 3120 3123 3126 3129 3132 3135 3138 3141 3144 3147 3150 3153 3156 3159 3162 3165 3168 3171 3174 3177 3180 3183 3186 3189 3192 3195 3198 3201 3204 3207 3210 3213 3216 3219 3222 3225 3228 3231 3234 3237 3240 3243 3246 3249 3252 3255 3258 3261 3264 3267 3270 3273 3276 3279 3282 3285 3288 3291 3294 3297 3300 3303 3306 3309 3312 3315 3318 3321 3324 3327 3330 3333 3336 3339 3342 3345 3348 3351 3354 3357 3360 3363 3366 3369 3372 3375 3378 3381 3384 3387 3390 3393 3396 3399 3402 3405 3408 3411 3414 3417 3420 3423 3426 3429 3432 3435 3438 3441 3444 3447 3450 3453 3456 3459 3462 3465 3468 3471 3474 3477 3480 3483 3486 3489 3492 3495 3498 3501 3504 3507 3510 3513 3516 3519 3522 3525 3528 3531 3534 3537 3540 3543 3546 3549 3552 3555 3558 3561 3564 3567 3570 3573 3576 3579 3582 3585 3588 3591 3594 3597 3600 3603 3606 3609 3612 3615 3618 3621 3624 3627 3630 3633 3636 3639 3642 3645 3648 3651 3654 3657 3660 3663 3666 3669 3672 3675 3678 3681 3684 3687 3690 3693 3696 3699 3702 3705 3708 3711 3714 3717 3720 3723 3726 3729 3732 3735 3738 3741 3744 3747 3750 3753 3756 3759 3762 3765 3768 3771 3774 3777 3780 3783 3786 3789 3792 3795 3798 3801 3804 3807 3810 3813 3816 3819 3822 3825 3828 3831 3834 3837 3840 3843 3846 3849 3852 3855 3858 3861 3864 3867 3870 3873 3876 3879 3882 3885 3888 3891 3894 3897 3900 3903 3906 3909 3912 3915 3918 3921 3924 3927 3930 3933 3936 3939 3942 3945 3948 3951 3954 3957 3960 3963 3966 3969 3972 3975 3978 3981 3984 3987 3990 3993 3996 4000

Follow us on Twitter Follow us on Facebook Follow us on YouTube

BMX RSS Feed

Spotter Training Agenda

Part I

- Who we are, and why we need spotters?
 - **Severe weather definitions**
 - What and how to report
 - Safety in storm spotting
- Break--

Part II

- Thunderstorm development and thunderstorm types
 - Mesocyclone
- Wall Clouds vs. Shelf Clouds; Scud Clouds and Tail Clouds
 - Tornado formation
 - Report what you see; photo polls
 - Spotter information recap; polls

Important Definitions



OUTLOOK

Anticipated weather hazards during the next 7 days.
Issued daily and updated as needed.
[Keep Tabs] ... Ready

CAUTION

WATCH

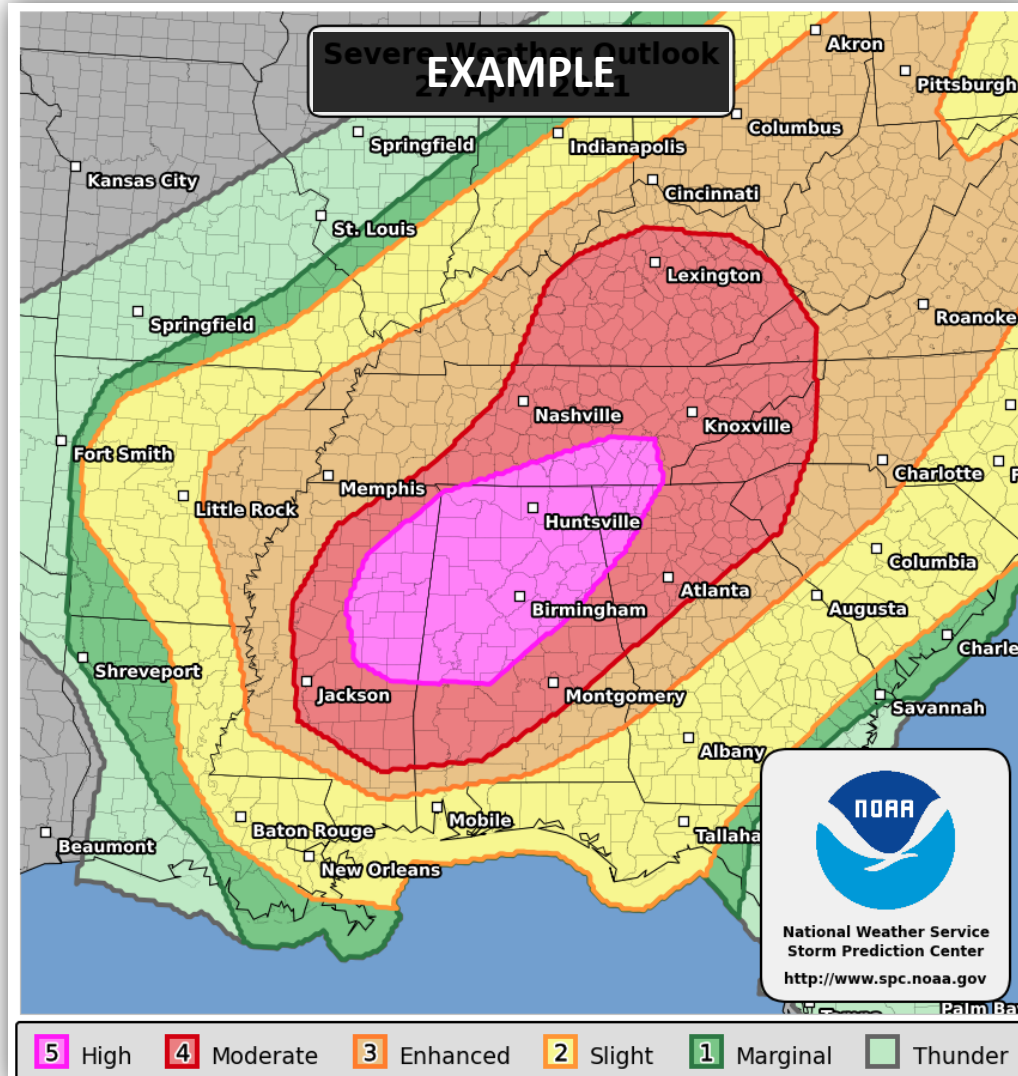
Atmospheric conditions are favorable, or could become favorable, for the development of thunderstorms which could produce severe weather.
[Remain Alert] ... Set



WARNING

Severe weather is occurring, or is likely to occur.
[Take protective action] ... GO!

Storm Prediction Center (SPC) Convective Outlook



Storm Prediction Center

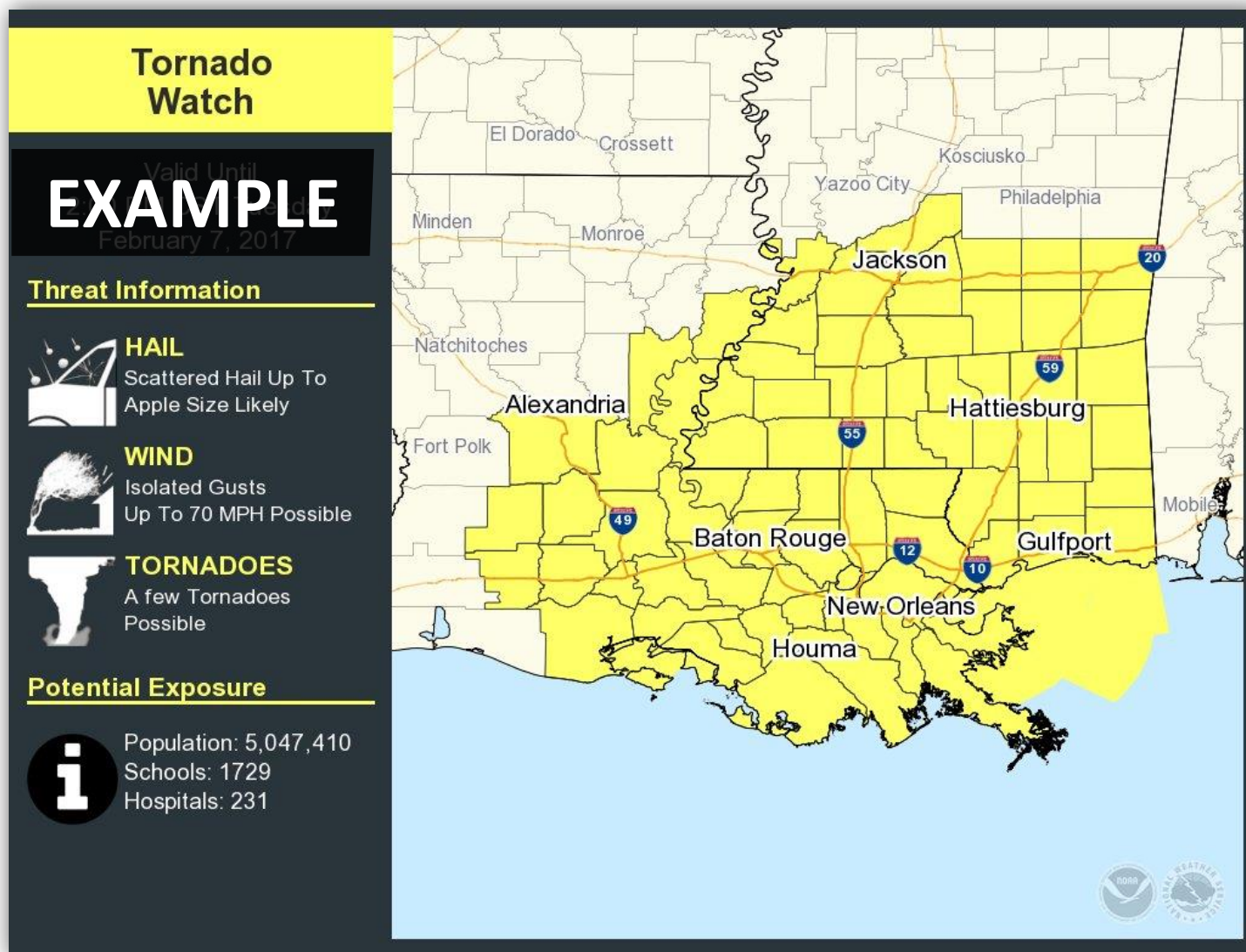
Severe Weather Outlook

Understanding Severe Thunderstorm Risk Categories

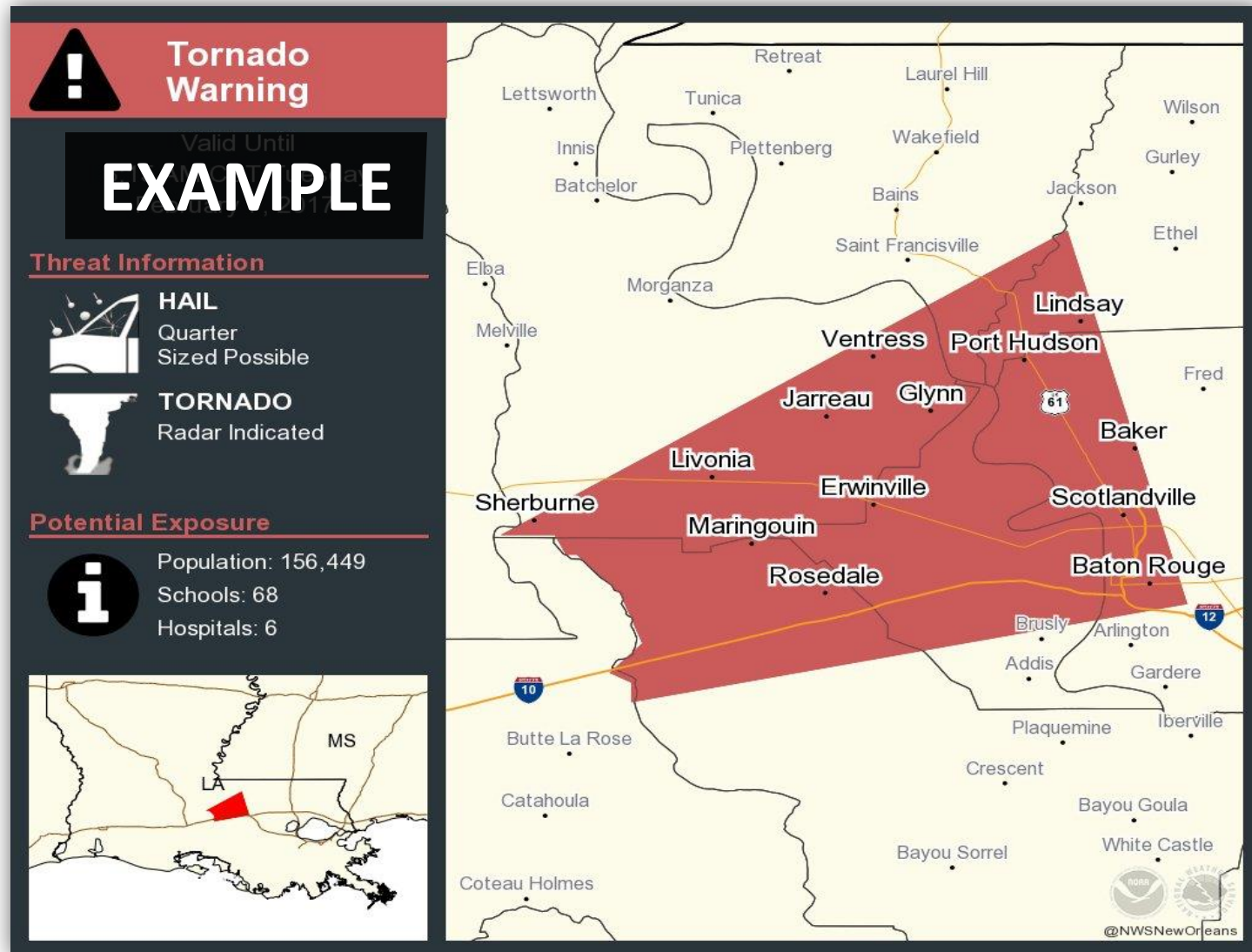
THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
No severe* thunderstorms expected	Isolated severe thunderstorms possible	Scattered severe storms possible	Numerous severe storms possible	Widespread severe storms likely	Widespread severe storms expected
Lightning/flooding threats exist with <u>all</u> thunderstorms	Limited in duration and/or coverage and/or intensity	Short-lived and/or not widespread, isolated intense storms possible	More persistent and/or widespread, a few intense	Long-lived, widespread and intense	Long-lived, very widespread and particularly intense
					
<ul style="list-style-type: none"> • Winds to 40 mph • Small hail 	<ul style="list-style-type: none"> • Winds 40-60 mph • Hail up to 1" • Low tornado risk 	<ul style="list-style-type: none"> • One or two tornadoes • Reports of strong winds/wind damage • Hail ~1", isolated 2" 	<ul style="list-style-type: none"> • A few tornadoes • Several reports of wind damage • Damaging hail, 1 - 2" 	<ul style="list-style-type: none"> • Strong tornadoes • Widespread wind damage • Destructive hail, 2" + 	<ul style="list-style-type: none"> • Tornado outbreak • Derecho

* NWS defines a severe thunderstorm as measured wind gusts to at least 58 mph, and/or hail to at least one inch in diameter, and/or a tornado. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles of your location.

Example Watch Area



Example Warning Area



What Makes a Storm Severe?

- Wind gusts of 58 MPH or greater, and/or
- Hail 1 inch or more in diameter

Severe Thunderstorm Warning is issued for potential of this occurring, or if observed



- A tornado also makes a storm severe

Tornado Warning is issued for potential of this occurring, or if observed

Lightning does not make a thunderstorm severe



Spotter Training Agenda

Part I

- Who we are, and why we need spotters?
 - Severe weather definitions
 - **What and how to report**
 - Safety in storm spotting
- Break--

Part II

- Thunderstorm development and thunderstorm types
 - Mesocyclone
- Wall Clouds vs. Shelf Clouds; Scud Clouds and Tail Clouds
 - Tornado formation
 - Report what you see; photo polls
 - Spotter information recap; polls

What to Report – Wind

Wind damage is just as important as speed measurement. Specify if gust is measured or estimated.

- Trees or limbs blown down
- Power poles or lines blown down
- Damage to buildings



Estimating Wind Speed

Most Estimates are too High!

25-31 MPH – large branches in motion

32-38 MPH – whole trees in motion

39-54 MPH – twigs break off; wind impedes walking

55-72 MPH – large branches broken, some trees uprooted, some structural damage

73-112 MPH – trees uprooted, snapped; removes shingles; windows broken; trailer homes overturned

113+ MPH – large trees uprooted, snapped; roofs torn off; weak buildings and trailer homes destroyed

The 'SET' Effect



During a severe weather event, Stress, Excitement, and Tension levels are running high...

This can alter your logic and reasoning abilities, leading to exaggerated reports

A wind gust of 40 MPH during fair weather probably wouldn't cause any great concern, but this same wind speed experienced during a thunderstorm may seem like 60MPH?

Remain calm and objective as possible. Use the table in the previous slide as a guide for accuracy and professionalism.

What to Report – Hail

Report the largest size hail stone you see.

Provide a measurement in inches, or reference a common item (e.g., quarter, golf ball, tennis ball).

Do not report marbles!

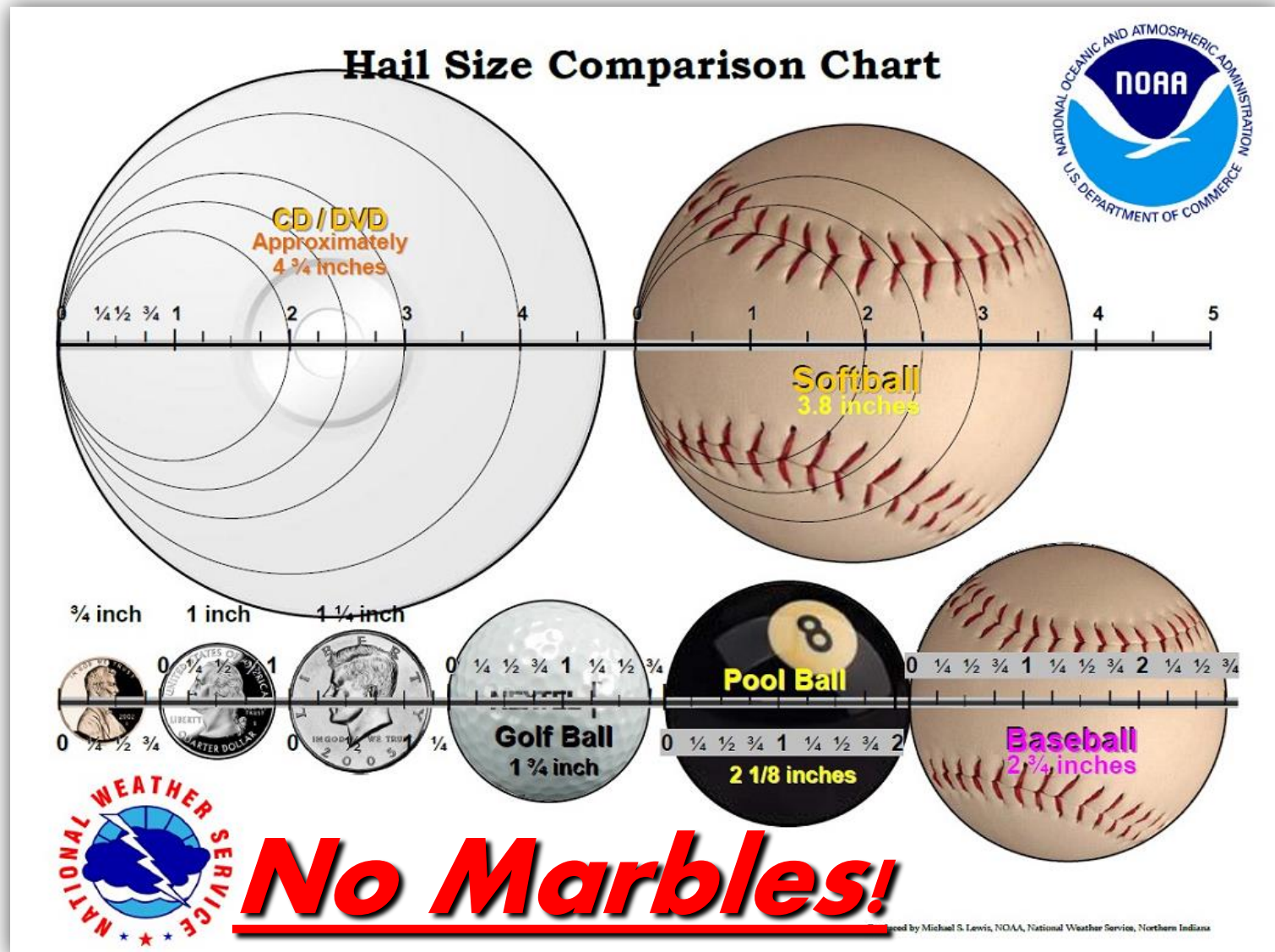


12 May 2011 - Kansas
Gerald Satterwhite



24 May 2015 - Liberal, KS
Gerald Satterwhite

Hail Size Comparison Chart



What to Report – Tornado, Funnel Cloud, or Wall Cloud



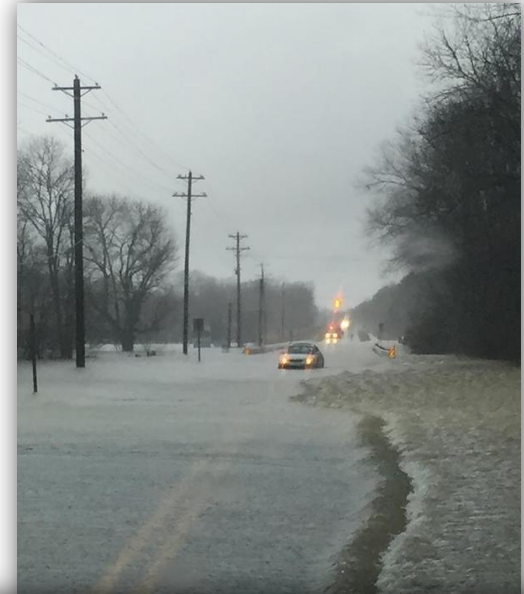
Definitions and
additional
information
coming up!

What to Report – Flash Flooding

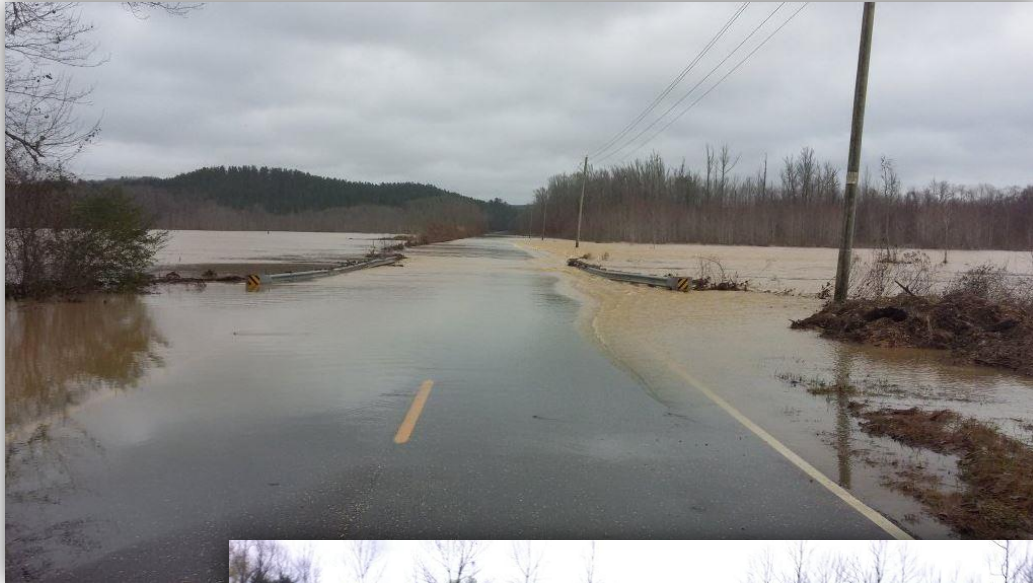
- A rapid rise, out-of-banks flow in a river or stream that is a threat to life or property
- Approx. 6 inches or more of flowing water over a road or bridge
- Any amount of water in contact with, flowing into, or causing damage to an above-ground building
- 3 feet or more of ponded water that poses a threat to life or property

Above items must occur within 6 hours of the causative event, such as heavy rain, a dam break, or ice jam release

Report areas of high water, which could flood with additional rainfall.



What to Report – Rural Flooding



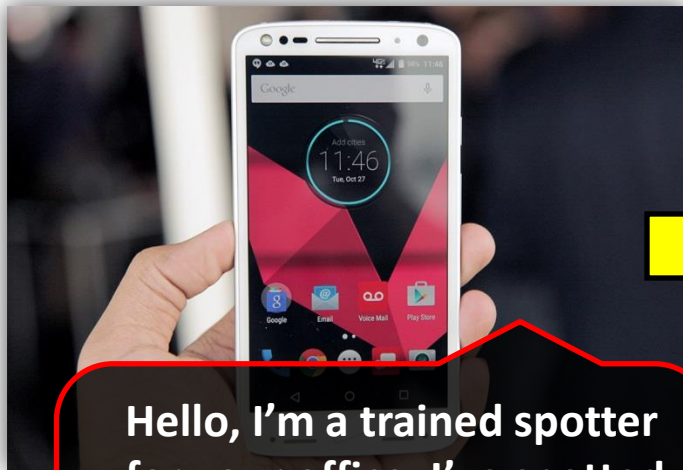
What to Report – Urban Flooding



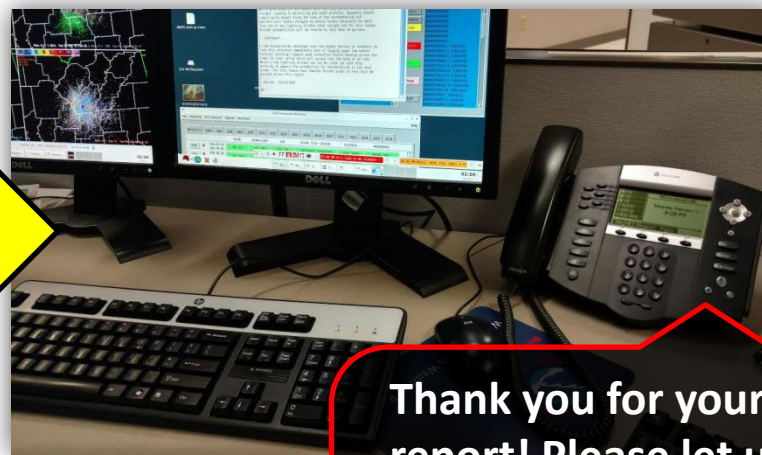
What to Report – Snow or Ice Accumulation



Submit a Report via Phone



Hello, I'm a trained spotter for your office. I've spotted a wall cloud with strong rotation passing about a mile north of Leeds.



Thank you for your report! Please let us know if you being to see a funnel cloud develop!

- NWS office phone number: 205-664-3010, option 2
- Your local Emergency Management Office
- Local law enforcement

Submit a Report on our Webpage

National Weather Service Forecast Office
Birmingham, AL
[Weather.gov](#) > NWS Birmingham, Alabama

NWS Birmingham, Alabama
Weather Forecast Office

Customize Your Weather.gov

City, ST

Enter Your City, ST or ZIP Code

☐ Remember Me

[Get Weather](#)

[Privacy Policy](#)

[Current Hazards](#) [Current Conditions](#) [Radar](#) [Forecasts](#) [Rivers and Lakes](#) [Climate and Past Weather](#) [Local Programs](#)

[Briefing Page](#)

[Outlooks](#)

[Submit a Storm Report](#)

Tonight **Sunday**

Weather Forecast Office
Birmingham, AL
Issued Feb 11, 2017 3:14 PM CST

Nighttime Lows/Rain Chances

Cloudy with a slight chance of a few sprinkles, light rain shower.

Hamilton 63°
Jasper 63°
Fayette 64°
Tuscaloosa 61°
Birmingham 63°
Gadsden 61°
Anniston 61°

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Submit a Storm Report
to the National Weather Service Birmingham, Alabama

Local detailed forecast by "City, ST" or ZIP code

Enter location: [Go](#)

This interface is intended to be used solely for the relay of storm information to the NWS. Other comments or information should be sent to the National Weather Service Birmingham, Alabama.


1. Event Location
Enter date/time/location of event. Please reference to major roadway or intersection for events within town/cities.

Date: Feb 11 2017

Time: 07:30 PM Central

Place: Location (ex: NW 10th)

Unable to perform automatic geolocation.
Error Message: [geolocation permission denied]



Click on the map to set your location for the report.

2. Event Type (Select all that apply)

☐ Flood

☐ Hail

☐ High Wind Speed

☐ Tornado/Funnel Cloud

☐ Wind Damage

☐ Snow

☐ Freezing Rain/Icing

☐ Heavy Rain

3. Additional Details
Provide any additional information that you feel is pertinent to your submission (500 characters maximum).

You may also pass along additional information by e-mailing them to the National Weather Service Birmingham, Alabama separately. (NWS BLM)

4. Contact Information
VOLUNTARY and WILL NOT be distributed.

Your Name: Spotter ID (if assigned):

E-mail address: Phone number:

Observer Profile:

[Review Report](#) [Read Report](#)

NOTE: If you have any questions about reporting weather and/or using this reporting form, please contact the [BIMB Webmaster](#).

USA.gov

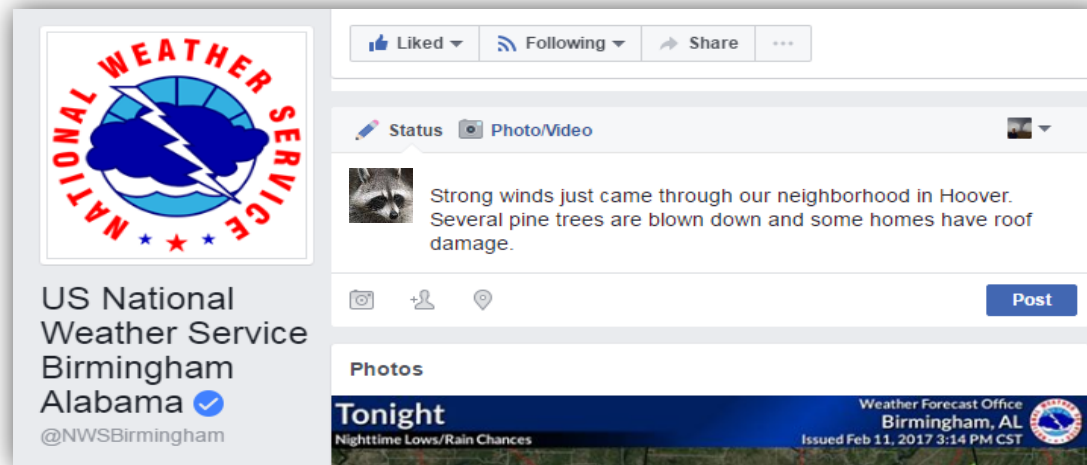
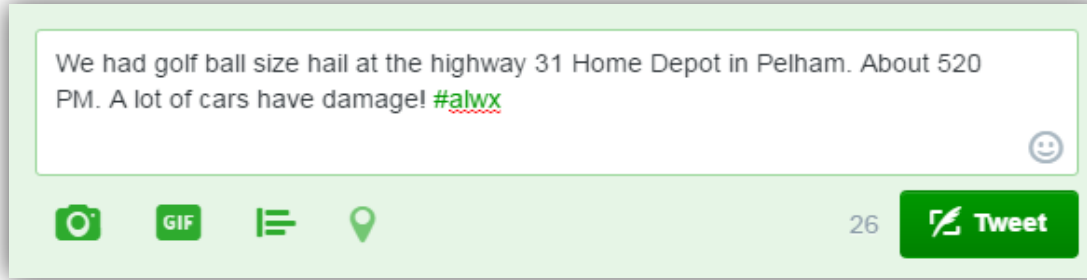
National Weather Service

Customer Information Quality Help Glossary

Privacy Policy Freedom of Information Act (FOIA) About Us Career Opportunities

Web Master's Email

Submit a Report via Social Media



We monitor social media during severe weather (and good weather). Send us a storm report via Facebook message, wall post; or Twitter direct message, Tweet.

Use #alwx and #bmwxw on Twitter and Facebook

Submit a Report via Ham Radio K4NWS

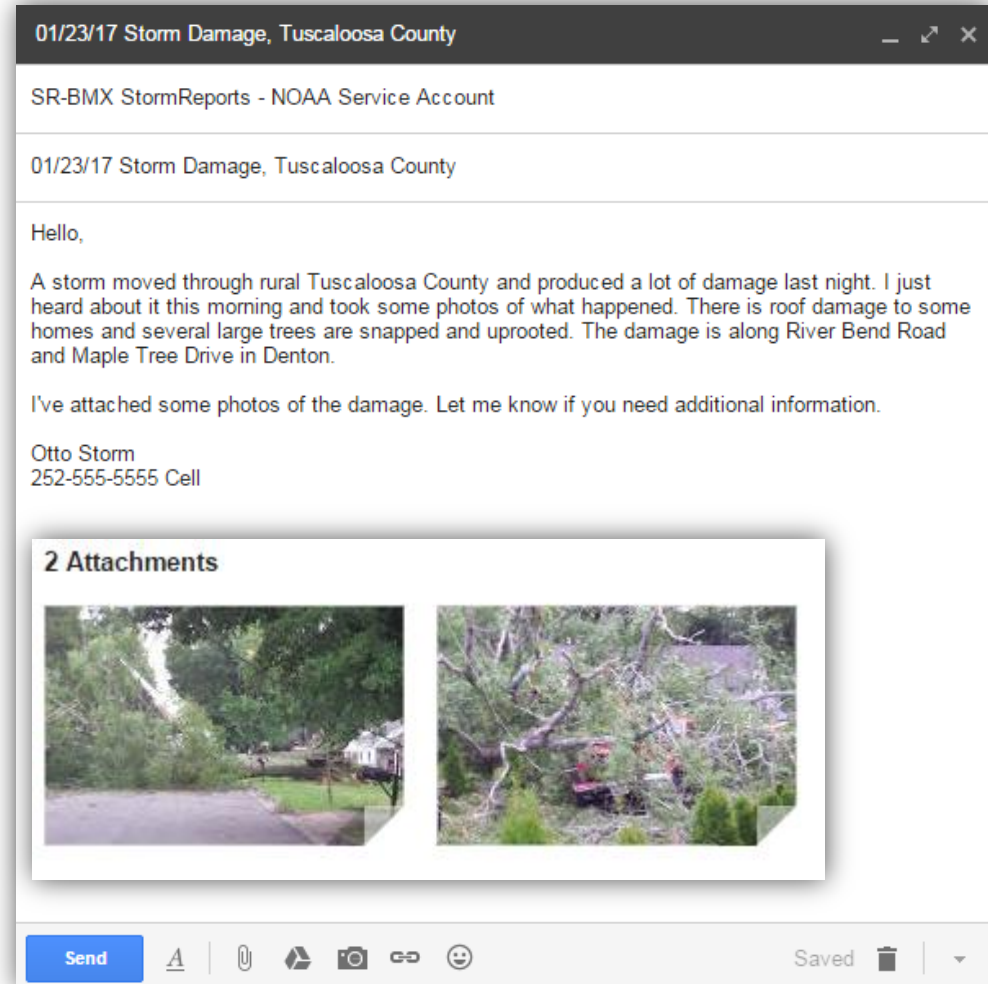




E-mail Option for Photos, Additional Information

sr-bmx.stormreports@noaa.gov

- Do you have follow-up information?
 - Heard of additional damage in the hours after the storm
 - A more elaborative description of what happened/damage details
 - A series of photos showing damage
 - Etc.
- E-mail reports can help us identify areas where damage occurred that we may not yet know about
- Give us a better picture of what's happened



Don't rely on e-mail for urgent reports! Such as large hail, damaging winds, tornado, funnel cloud on-going!

Effective Spotter Report(s)

- Keep it brief
- Identify yourself as a NWS trained storm spotter
- Tell us: who, what, when, where
- Examples:



My name is Otto Storm and I'm a trained spotter in Calera, AL. At 5PM I spotted a tornado just south of county road 87, and it then crossed I-65. Several cars have been flipped, along with damage to trees and homes near X county road. My GPS coordinates are xx.xx, xx.xx and I can be reached at xxx-xxxx.

My name is Otto Storm and I'm a trained spotter in Gadsden, AL. I've spotted a funnel cloud about 1 mile northeast of town. We also had quarter-size hail about 10-minutes ago.

My name is Otto Storm and I'm a trained spotter in Center Point, AL. We had strong winds 10-minutes ago. I'd estimate them at about 60 MPH. There are several trees blown down, with two homes hit by falling trees.

Effective Spotter Report(s)

- Do not assume that if a warning is issued, the NWS knows for certain that severe weather has occurred. We want to hear from you!
- Get your report to us ASAP (and when you are safe). Weather events are time-sensitive!
- Never assume your report is not important!
- Do not exaggerate your report!
- If you are relaying a report, please let us know that you did not witness it first-hand.



Spotter Training Agenda

Part I

- Who we are, and why we need spotters?
 - Severe weather definitions
 - What and how to report
 - **Safety in storm spotting**
- Break--

Part II

- Thunderstorm development and thunderstorm types
 - Mesocyclone
- Wall Clouds vs. Shelf Clouds; Scud Clouds and Tail Clouds
 - Tornado formation
 - Report what you see; photo polls
 - Spotter information recap; polls

Spotter Safety

The safety of you and those around you is more important than any storm report or storm photo

- **Personal safety is the primary objective of every spotter**
- **ACES (Awareness-Communication-Escape Route-Shelter)**
- **Spot with someone**
- **Obey federal, state, and local laws; directives from public safety officials**
- **Never take shelter under a highway overpass**
- **Remain aware of the weather situation around you!**

Lightning Safety

Safety Guidelines

- Move inside a well-constructed building; avoid electrical appliances and metal surfaces
- If outdoors without shelter, crouch down low, but do not lie flat on the ground
 - Avoid isolated trees, and stay away from the tallest trees; avoid tall objects
 - Avoid bodies of water
 - Avoid elevated areas like hills peaks
- No boating or outdoor activities
- Stay in your car

Facts

- Lightning can strike as far as 10 miles away from the parent thunderstorm
- ‘Heat lightning’ is not real – rather it’s lightning from a distant thunderstorm, too far away for thunder to be heard
- Stay in shelter at least 30 minutes after you hear the last rumble of thunder



When Thunder Roars, Go Indoors!

STOP all activities.

Seek shelter in a substantial building or hard-topped vehicle.

Wait 30 minutes after the storm to resume activities.

 www.lightningsafety.noaa.gov 

Flooding Safety

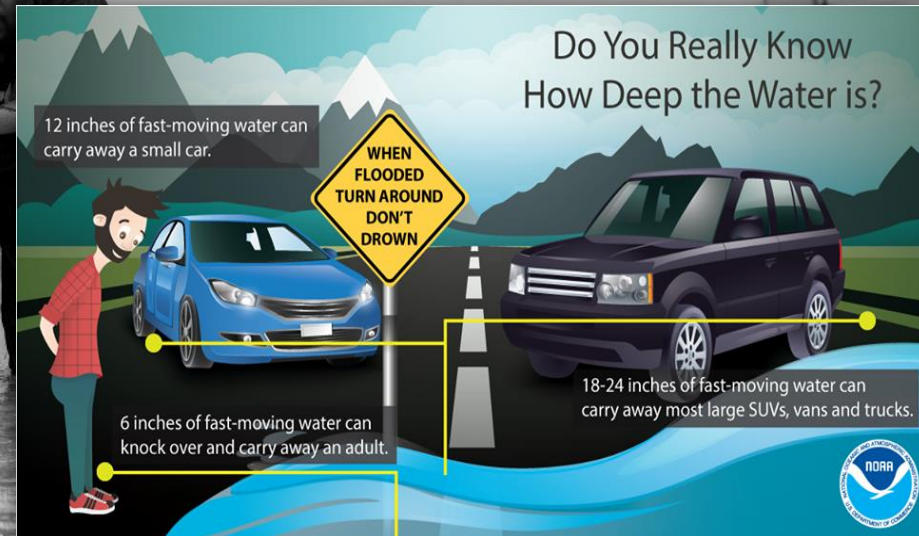
WHEN
FLOODED
TURN AROUND
DON'T
DROWN

Safety Guidelines

- **Never cross water of unknown depth!**
 - Roads may be washed out or there could be underwater obstructions
- **Get to higher ground and avoid low spots in the roadway**
- **Never cross barriers put in place by emergency officials**
- **Flood dangers are harder to recognize at night**

Fact

- **Flooding is the leading cause of weather-related deaths in the U.S.**



Tornado Safety

Safety Guidelines

In homes or small business

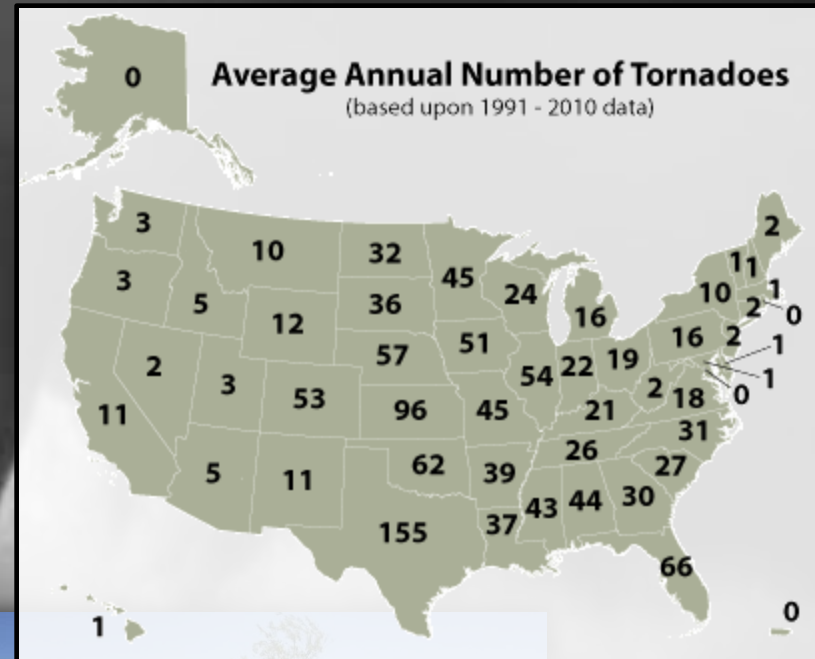
- Go to the basement or small interior room, closet. Cover your head and stay away from windows.

In mobile homes

- Get out and take shelter in a sturdy building or storm shelter
- There is no safe place to shelter in a mobile home!*

In a vehicle

- If you can't drive away, get out and into a sturdy shelter. If there is no shelter, get to a low spot (dry ditch) and cover your head.



Sheltering from the Storm



Halftime!

10-minute Break

Next, the Goods: Thunderstorm
and Tornado Imagery!

GOES VISIBLE SATELLITE 22 MAY 16 18:15



Spotter Training Agenda

Part I

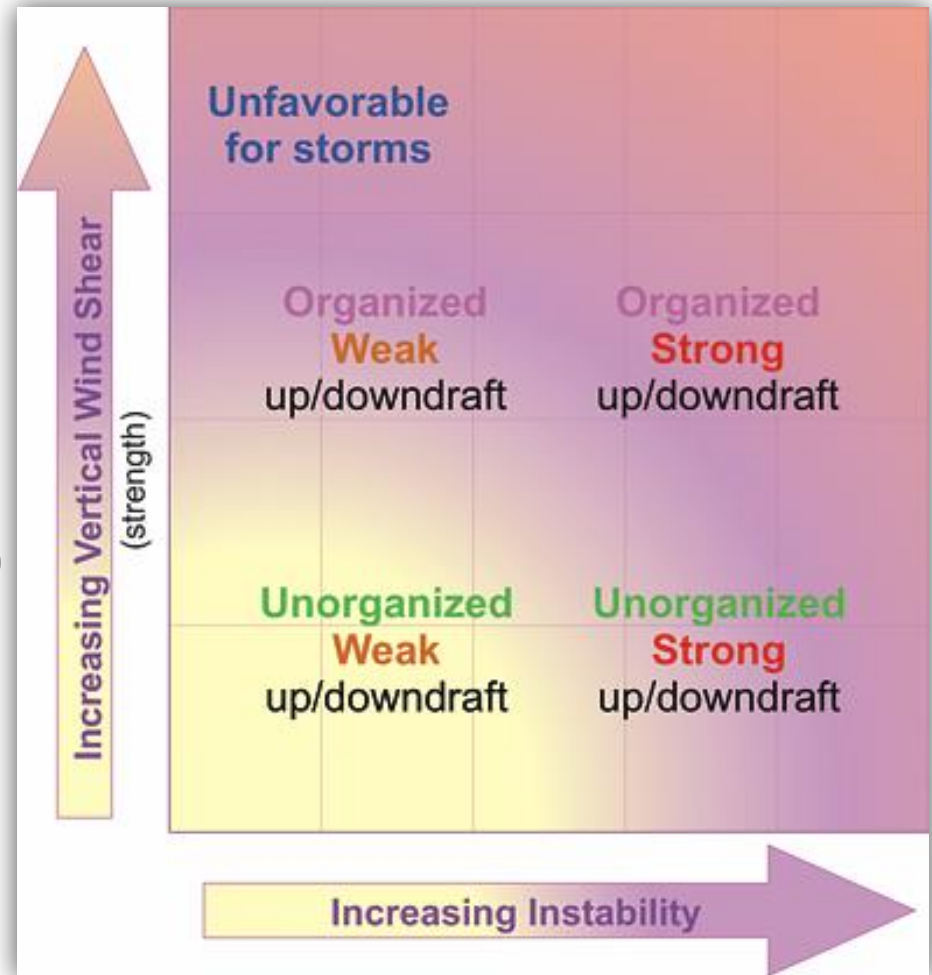
- Who we are, and why we need spotters?
 - Severe weather definitions
 - What and how to report
 - Safety in storm spotting
- Break--

Part II

- **Thunderstorm development and thunderstorm types**
 - Mesocyclone
- Wall Clouds vs. Shelf Clouds; Scud Clouds and Tail Clouds
 - Tornado formation
 - Report what you see; photo polls
 - Spotter information recap; polls

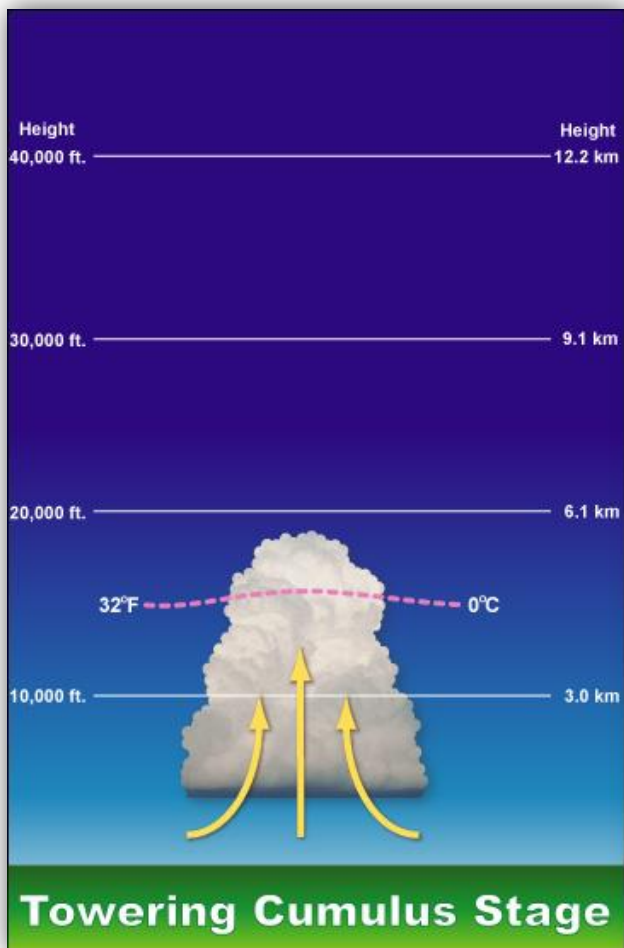
Ingredients for Thunderstorm Formation

- Lift
 - Cold front
 - Warm front
 - Gust front, outflow boundary
 - Terrain (upslope flow)
 - Surface heating
- Moisture
- Instability

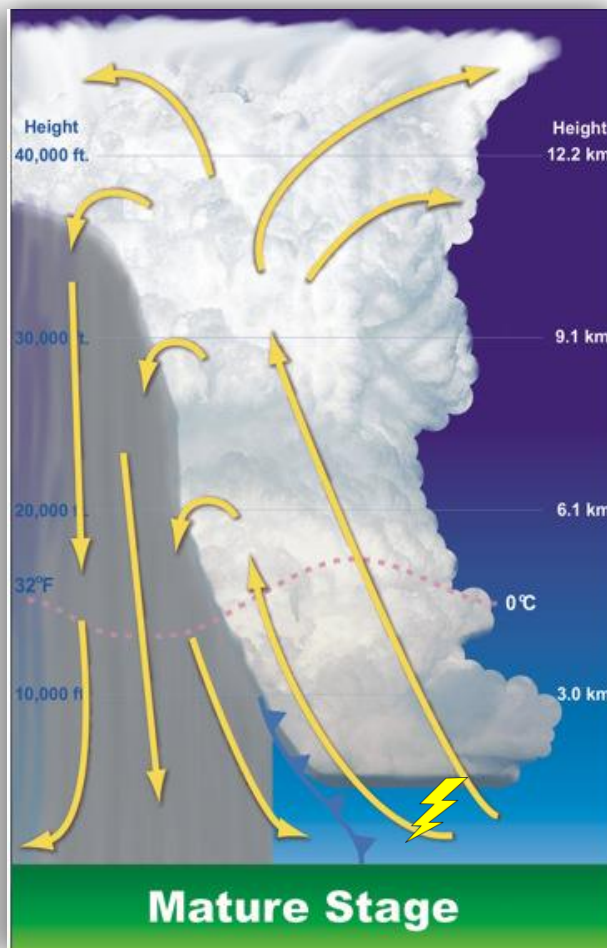


*Wind Shear helps with thunderstorm organization/longevity and severity

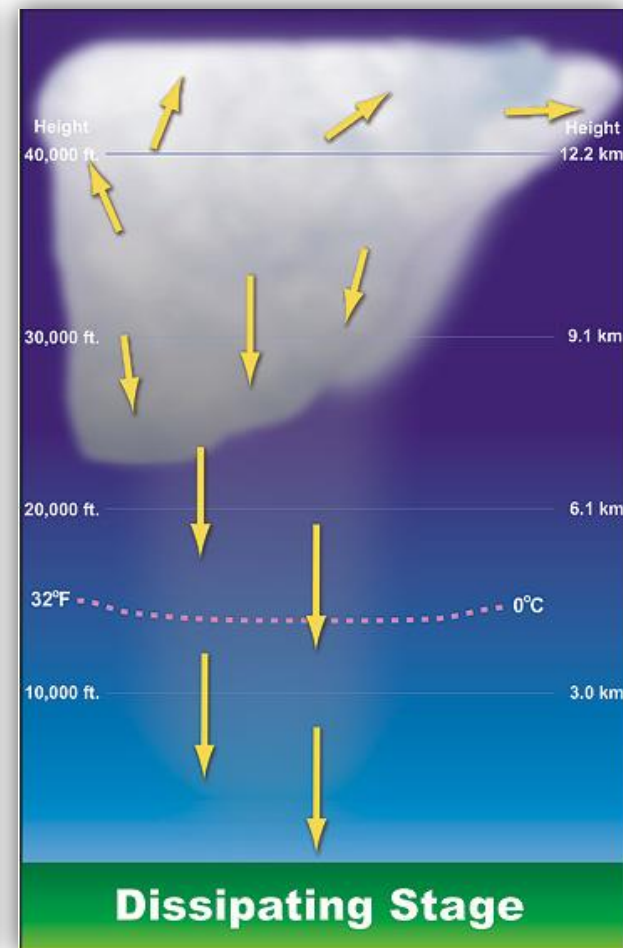
Thunderstorm Stages



- Updraft dominates
- Cumulus cloud grows vertically
- Up to ~20,000 feet tall



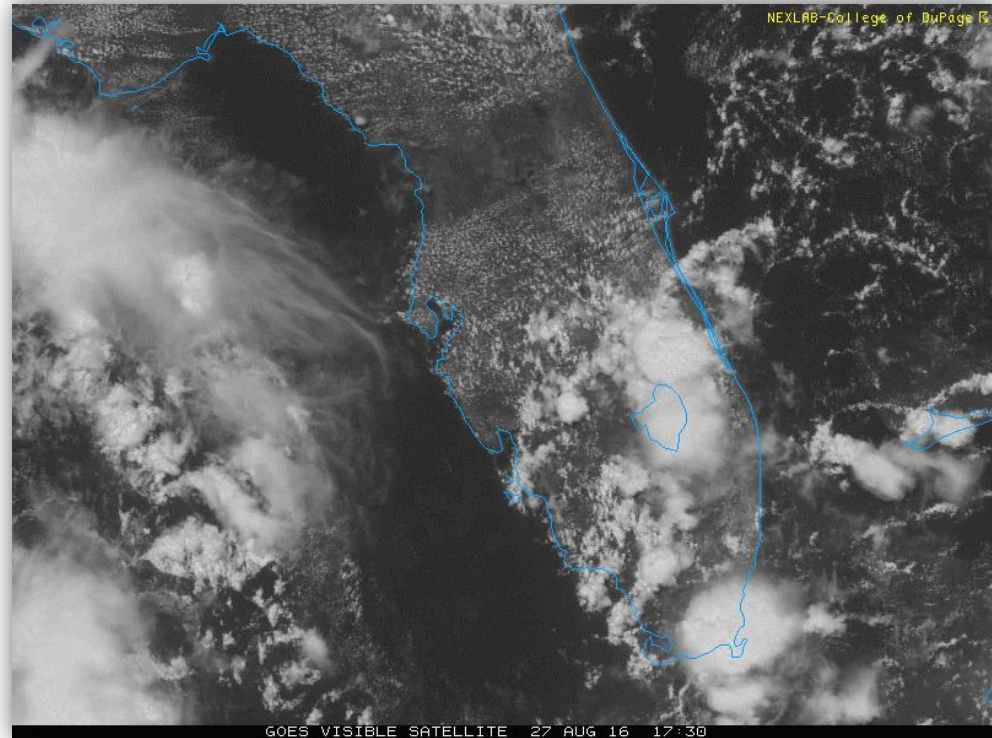
- ~40,000 to 60,000 feet tall
- Strong updraft and downdraft coexist
- Large hail, damaging winds, tornado(es), and flooding rain may occur



- Downdraft cuts off updraft
- Rain, gusty winds, and last lightning strike
- Remnant anvil cloud aloft

Thunderstorm Types

- Single cell
- Multicell
 - Cluster
 - Line
- Supercell
 - Classic
 - Low-precipitation (LP)
 - High-precipitation (HP)
- Mini-supercell



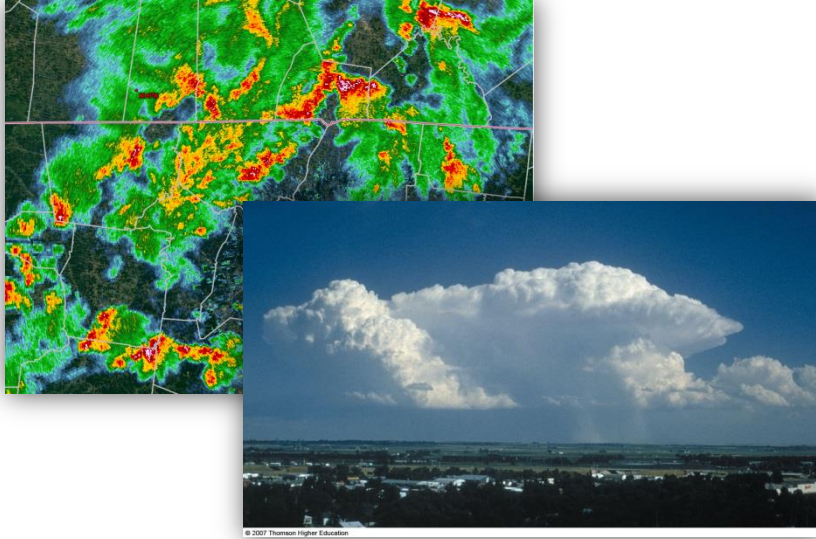
Thunderstorm Types – Single Cell (pulse thunderstorm)

Emphasis: we are talking about pulse thunderstorms, not single cell to include supercell storms!

- Rather short-lived
- Can be randomized in location
- No or low severe weather threat



Thunderstorm Types - Multicell



Multicell Cluster

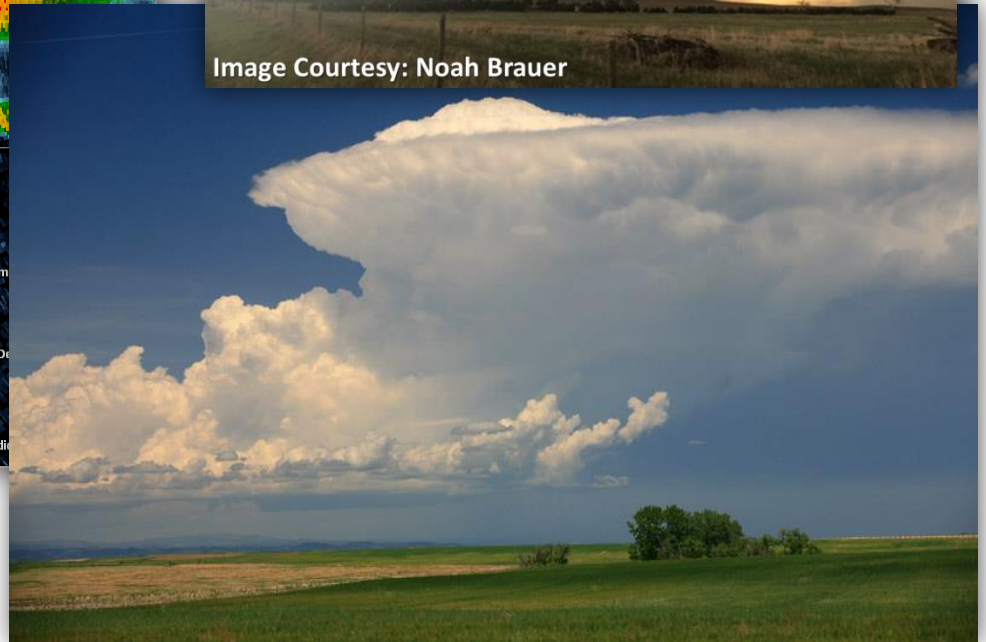
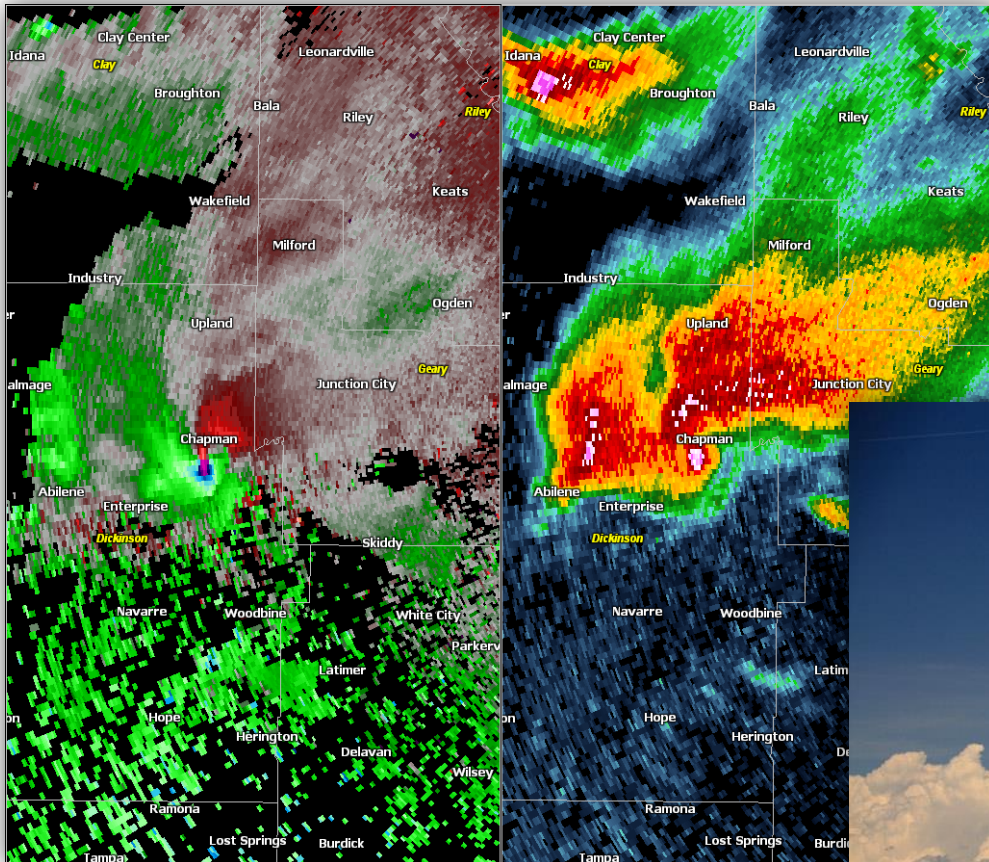
- Low severe weather threat
- Several storm cells in a clump, but each in a different stage of the thunderstorm lifecycle
- Cells 'take turns' at being most dominant
- Gusty, sometimes damaging winds; hail



Multicell Line (squall line)

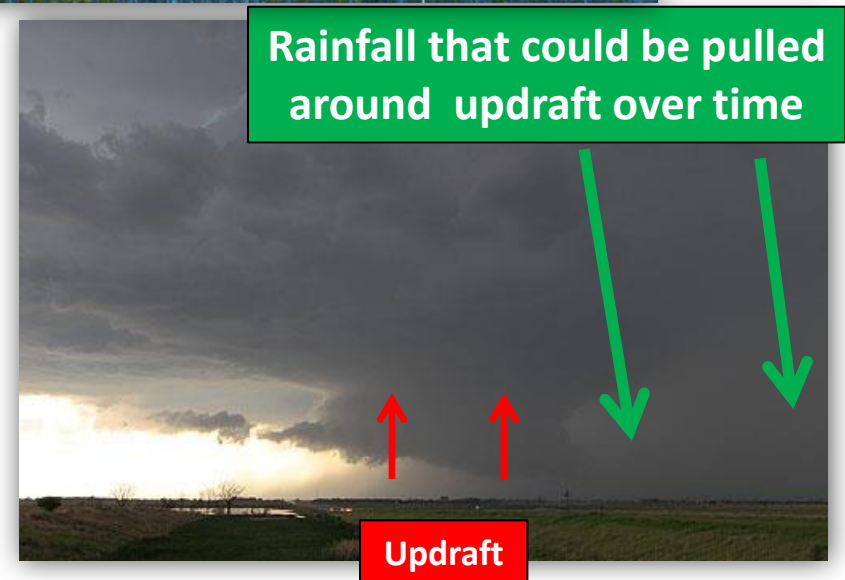
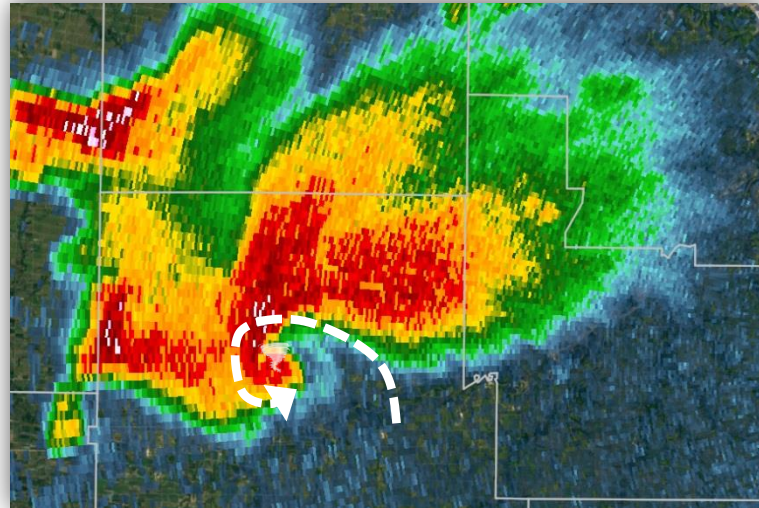
- Moderate to high severe weather threat (depending on the environment)
- Several storm cells form a line along the leading edge of the system
- Moderately gusty winds to widespread damaging winds (depending on the environment)
- Weak to strong tornadoes (depending on the environment)

Thunderstorm Types - Supercell



Thunderstorm Types – Supercell (Classic)

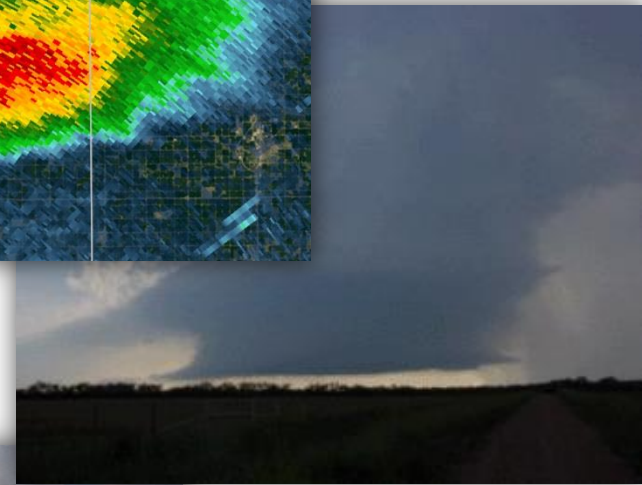
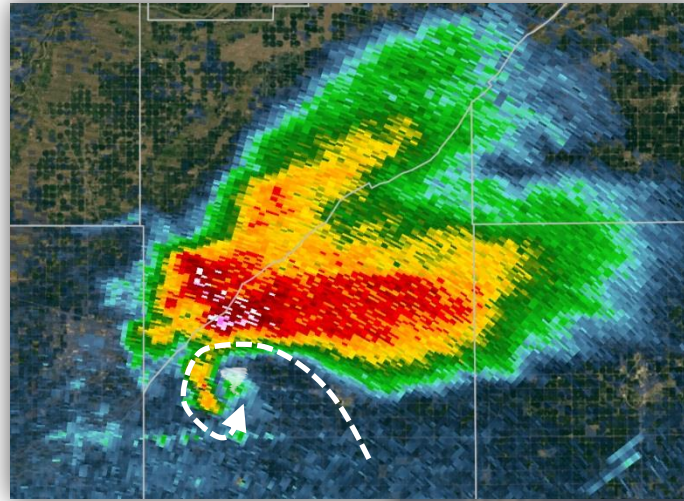
- Rotating and visible updraft; however, heavy rain can eventually be pulled around the updraft, obscuring it
- High severe weather threat
 - Large to very large hail
 - Damaging winds
 - Tornado(es)
 - Flash flooding



Thunderstorm Types – Supercell

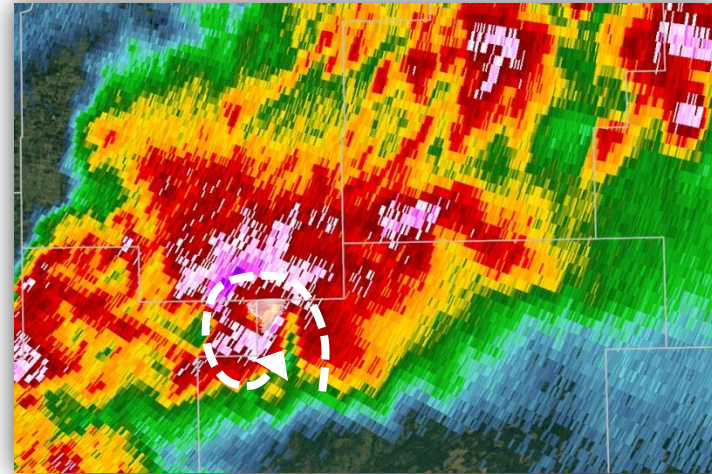
(Low Precipitation; LP)

- Rotating updraft often with no or very little rain in vicinity
- Hook echo may not be visible on radar, or very faint
- Low to high severe weather threat (depends on the environment)
 - Large to very large hail
 - Damaging winds
 - Tornado(es)
- Very, very rare for Alabama; more common in drier regions

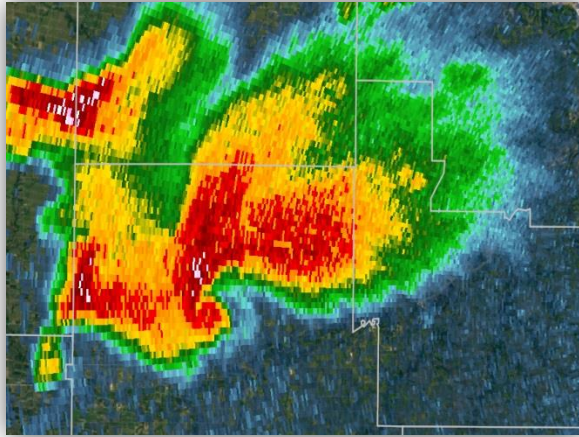


Thunderstorm Types – Supercell (High Precipitation; HP)

- Rotating updraft often obscured by heavy rainfall (and sometimes hail)
 - Therefore the tornado will be very hard or impossible to see!
- High severe weather threat
 - Large to very large hail
 - Damaging winds
 - Tornado(es)
 - Flash flooding

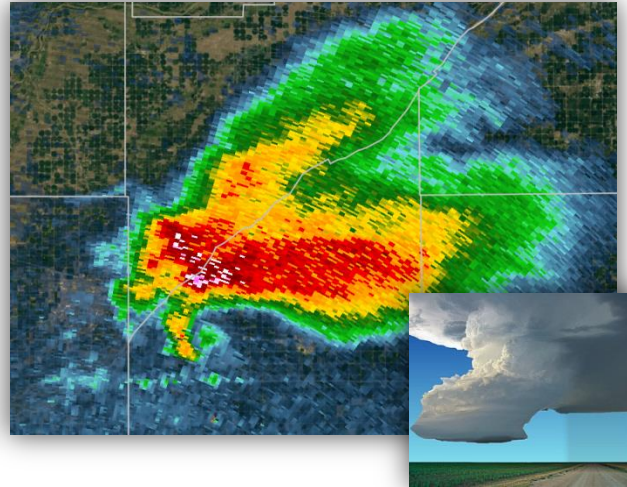


Supercell Type Recap



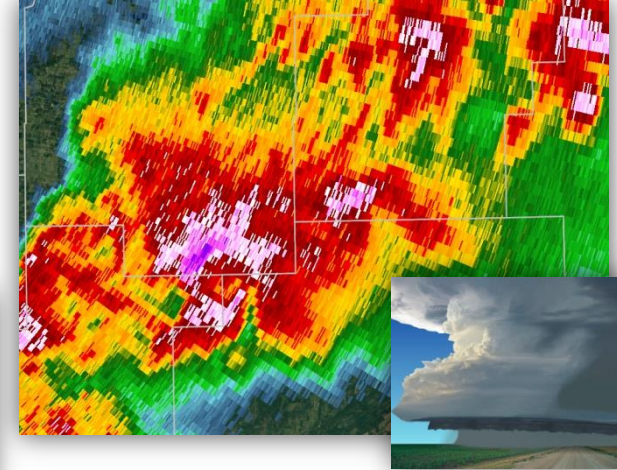
Classic

>> **Updraft (and tornado if occurring) visible, but could become rain-wrapped with time**



Low Precipitation (LP)

>> **Updraft (and tornado if occurring) highly visible**

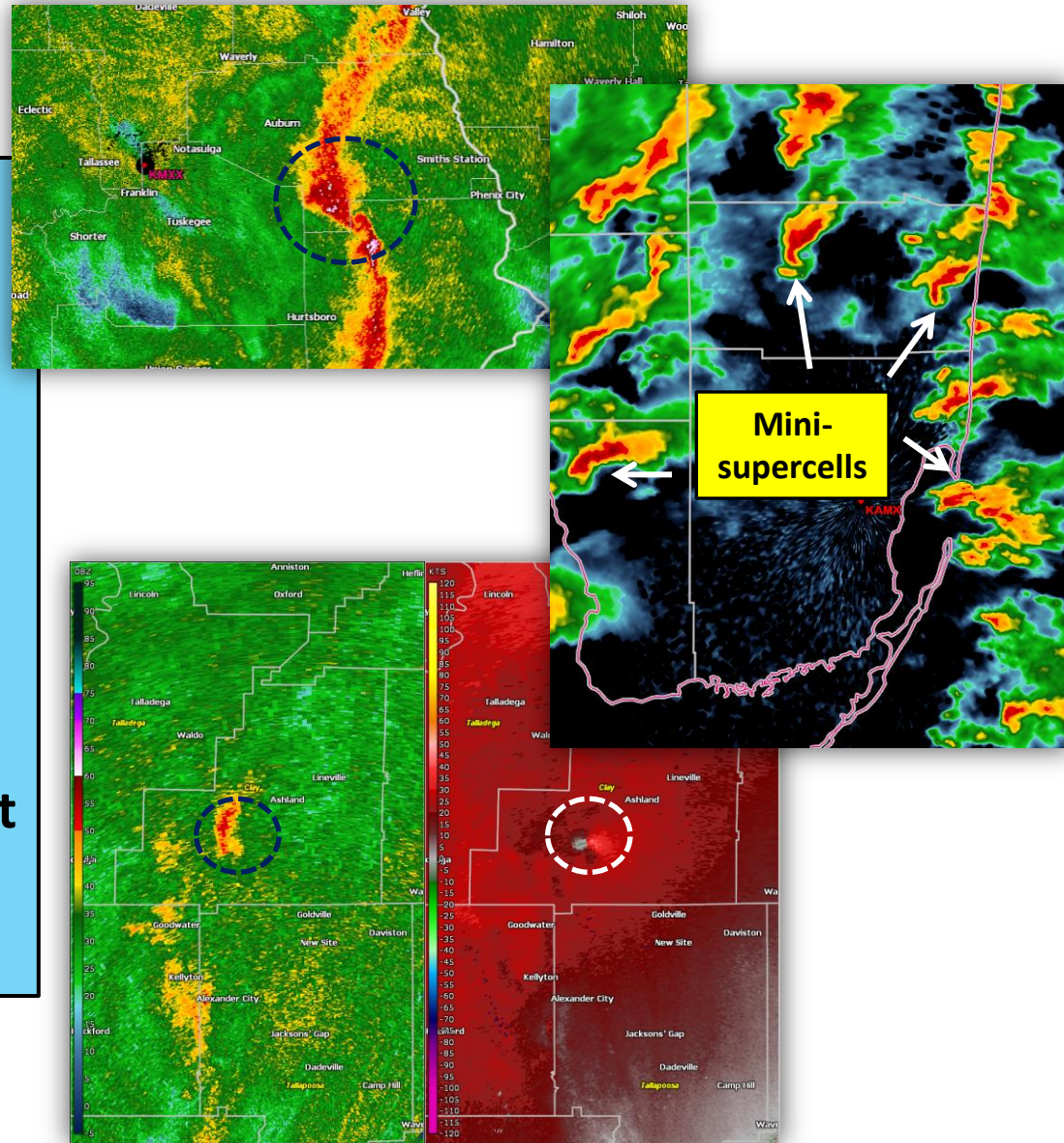


High Precipitation (HP)

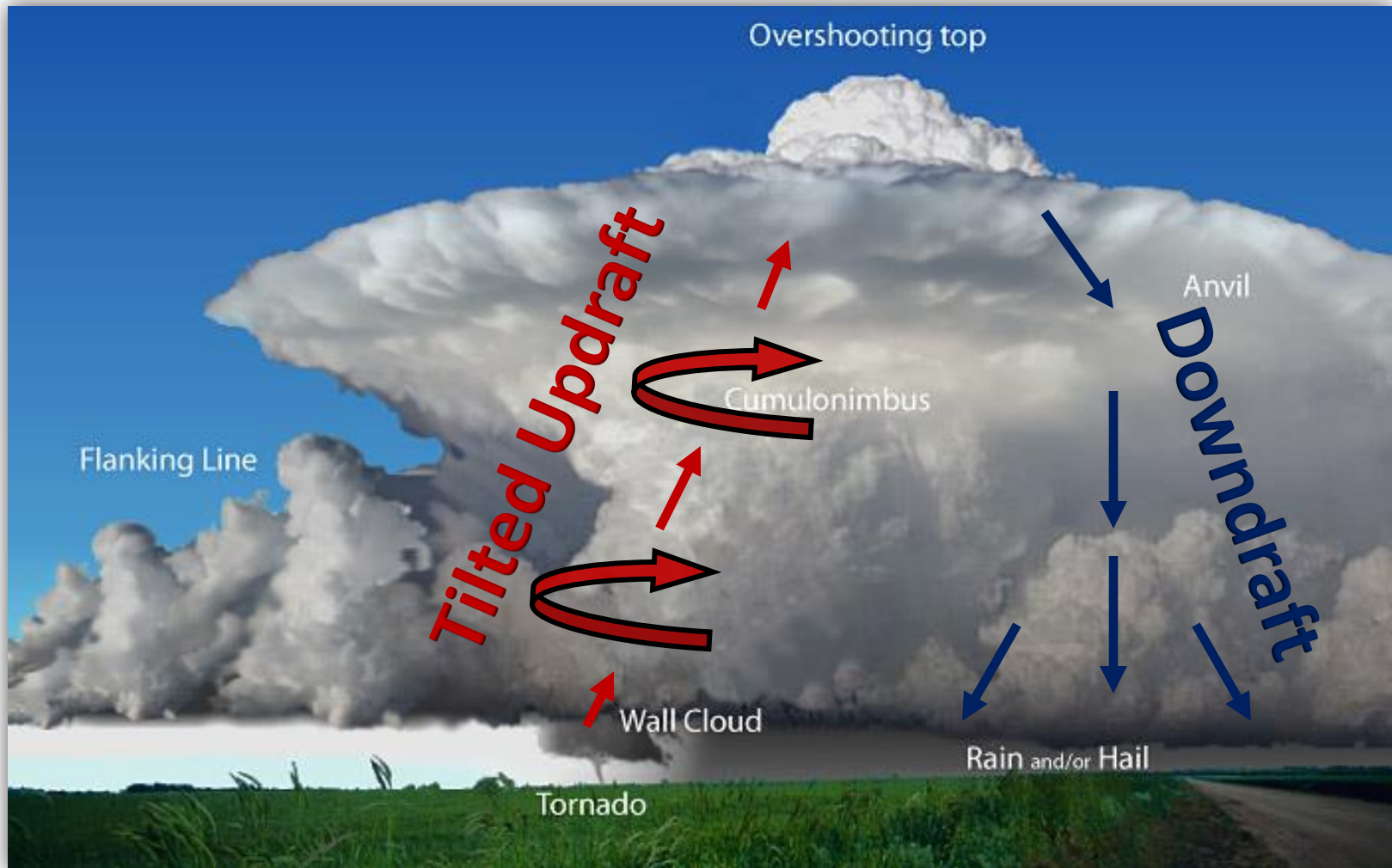
>> **Updraft (and tornado if occurring) are rain-wrapped**

Mini-Supercell

- A small, shallow storm with a rotating updraft
- Can be within a large shield of rain, a line of storms, or discrete
- Severe threat not as 'significant' as their counterparts
 - Low wind and hail threat
 - Can produce a brief, weak tornado(es)



Supercell Thunderstorm Structure

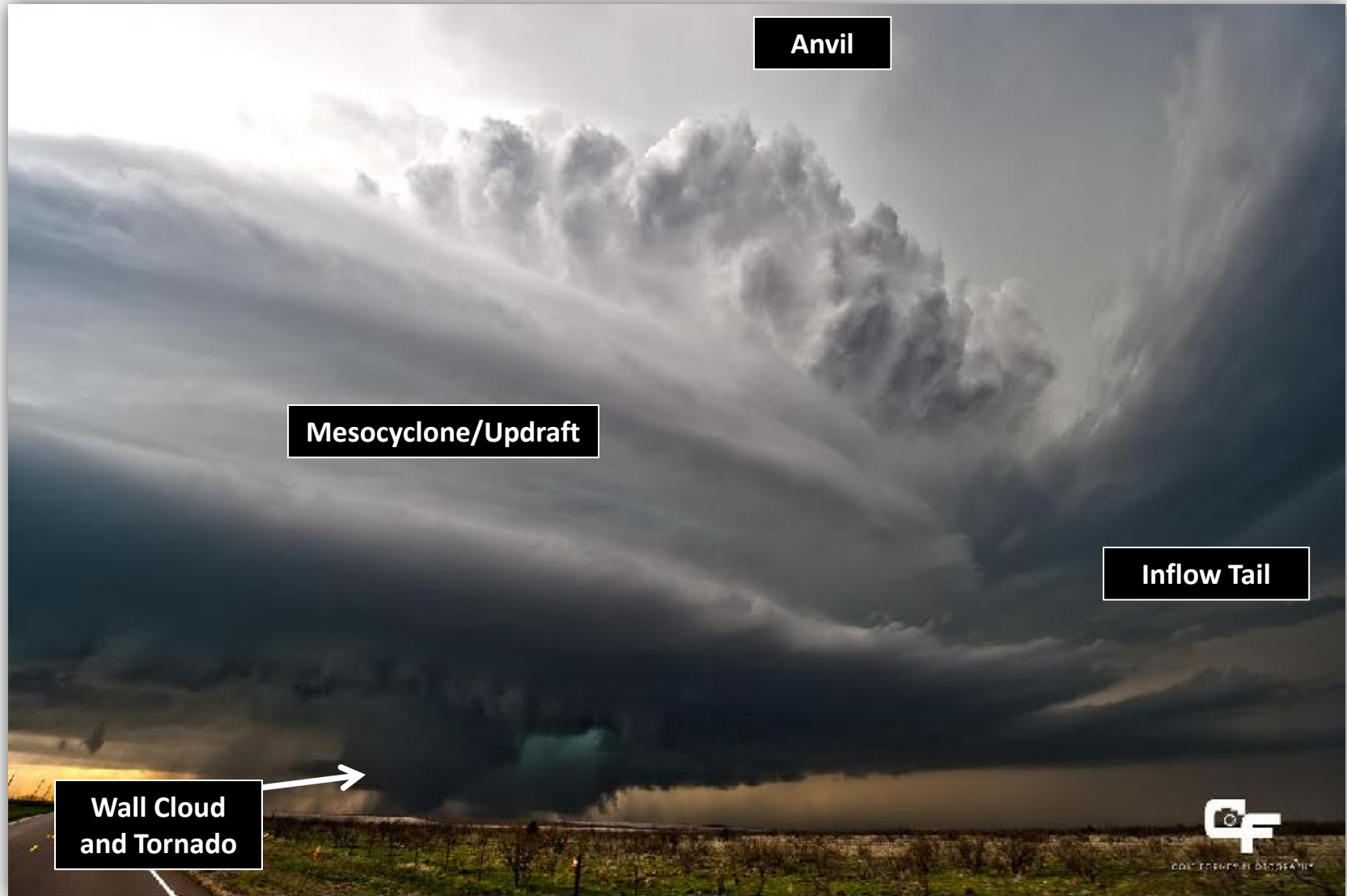


Supercell Structure Real-world Showcase

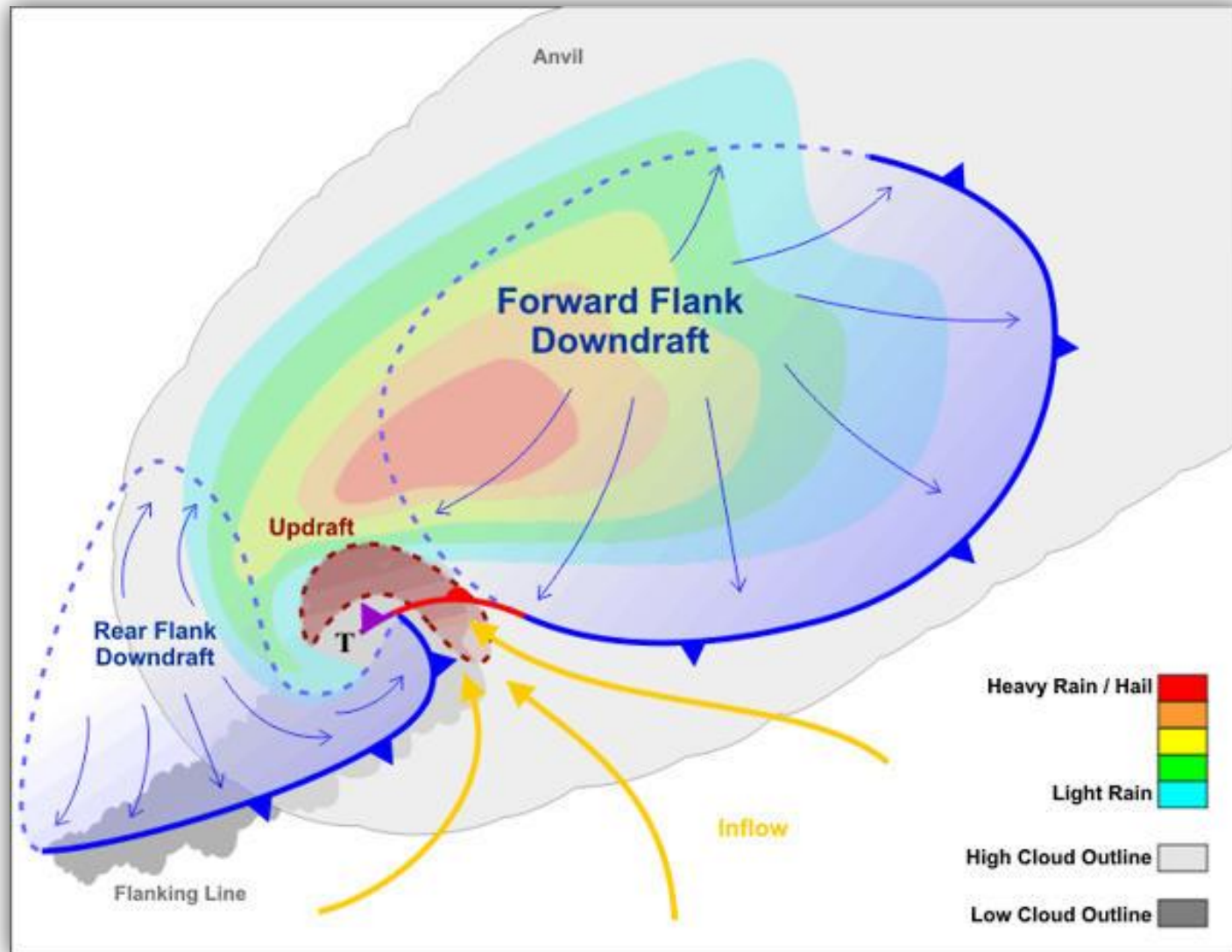


Supercell Structure

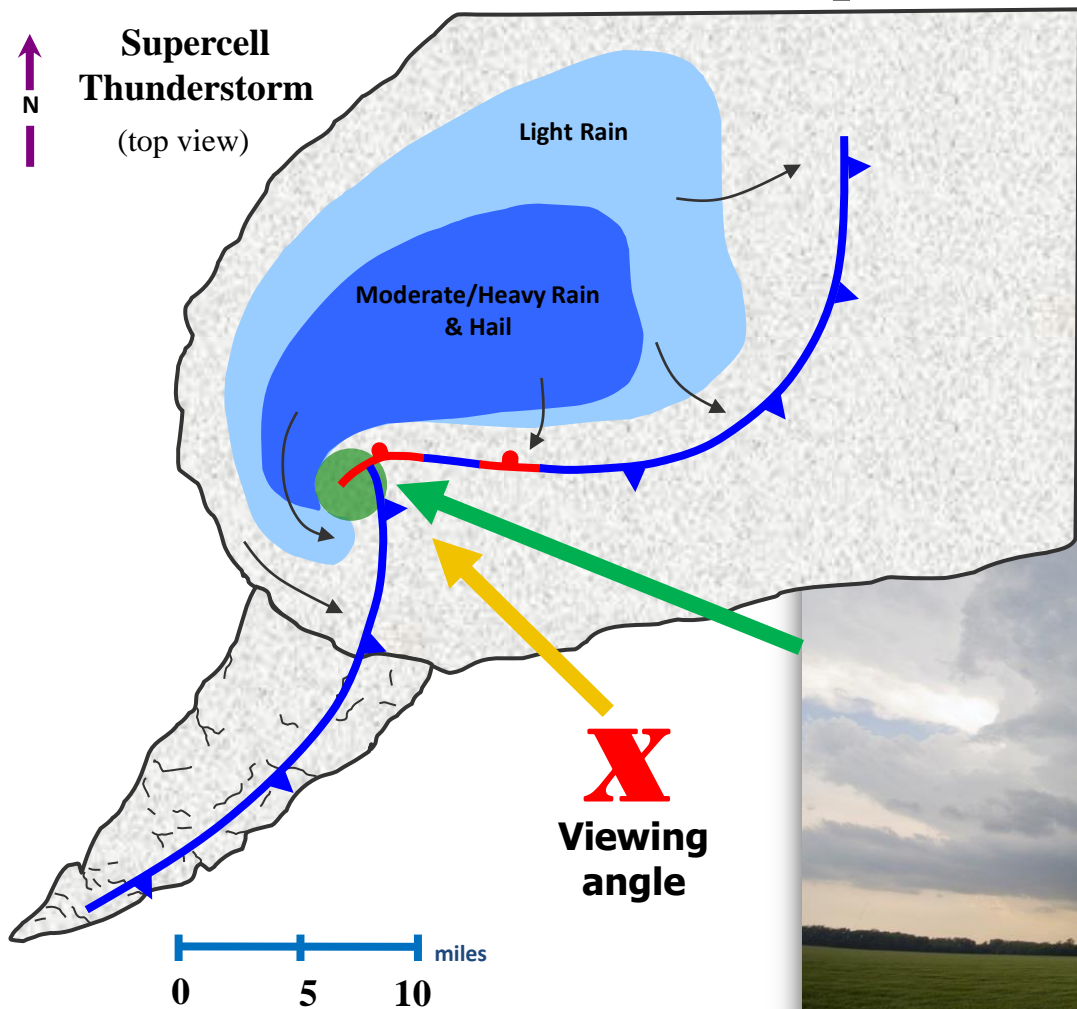
Real-world Showcase



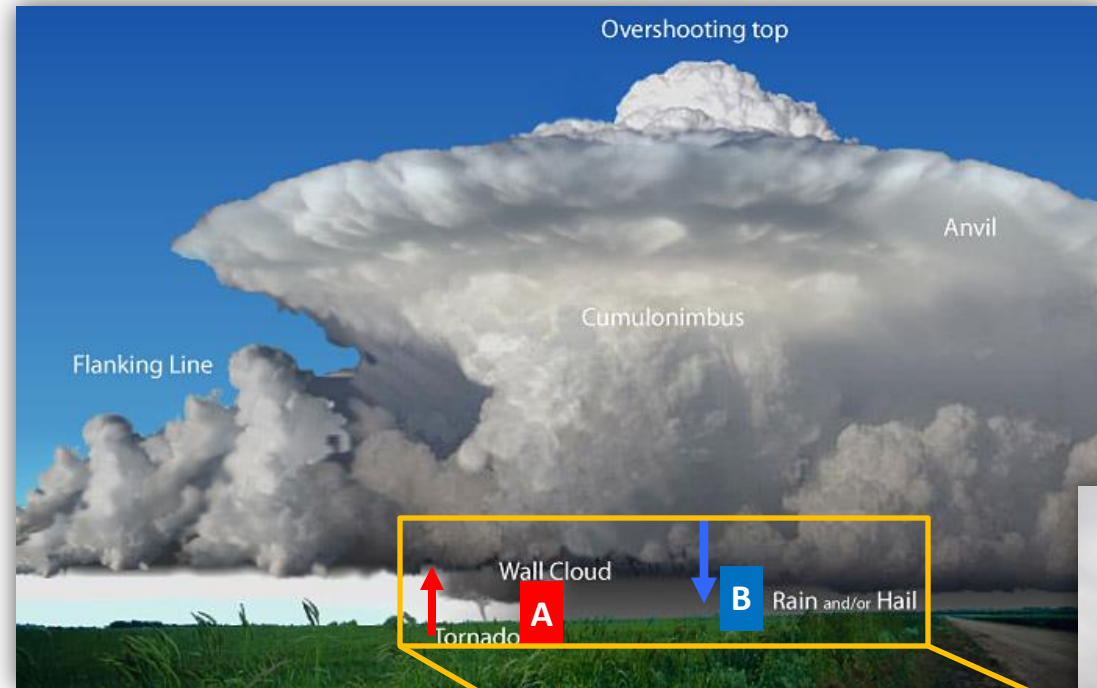
Supercell Thunderstorm Structure



Spotter Positioning on a Supercell

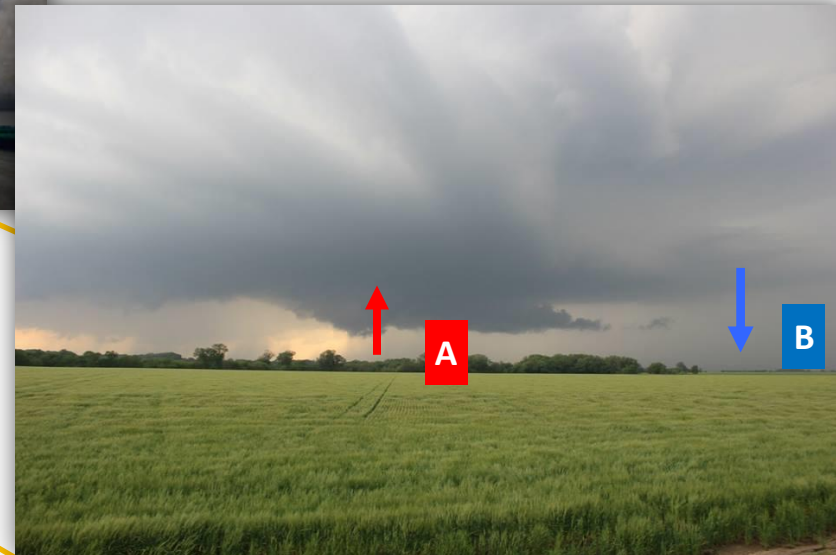


Supercell Thunderstorm Structure



A: Warm air feeds into the updraft. Wall cloud, funnel cloud, and tornado occur here.

A: Rain-cooled air descends to the ground in the downdraft. Rain, hail, and strong winds occurs here. Dark portion of the storm.



Spotter Training Agenda

Part I

- Who we are, and why we need spotters?
 - Severe weather definitions
 - What and how to report
 - Safety in storm spotting
- Break--

Part II

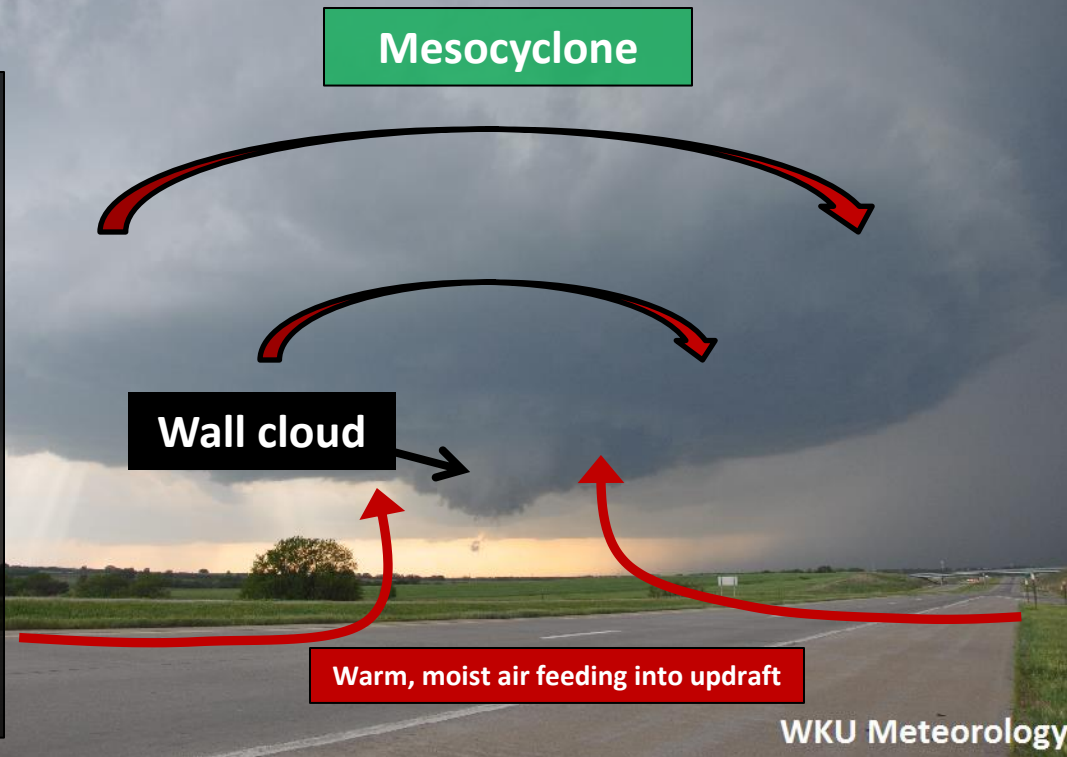
- Thunderstorm development and thunderstorm types
 - **Mesocyclone**
- Wall Clouds vs. Shelf Clouds; Scud Clouds and Tail Clouds
 - Tornado formation
 - Report what you see; photo polls
 - Spotter information recap; polls

Mesocyclone – Region of Rotation and Inflow Winds

Storm-scale area of deep, rotation (counter-clockwise) -- It's the parent circulation.

Wall cloud and tornado forms underneath the mesocyclone.

Don't confuse with a common rain-free base. The updraft needs to be rotating!



Mesocyclone– Characteristics

- A storm-scale region of rotation, typically 2-6 miles in diameter
- The circulation of a mesocyclone covers an area much larger than the wall cloud or tornado that may develop underneath it
- Striations appear on strong, well-developed mesocyclones



Spotter Training Agenda

Part I

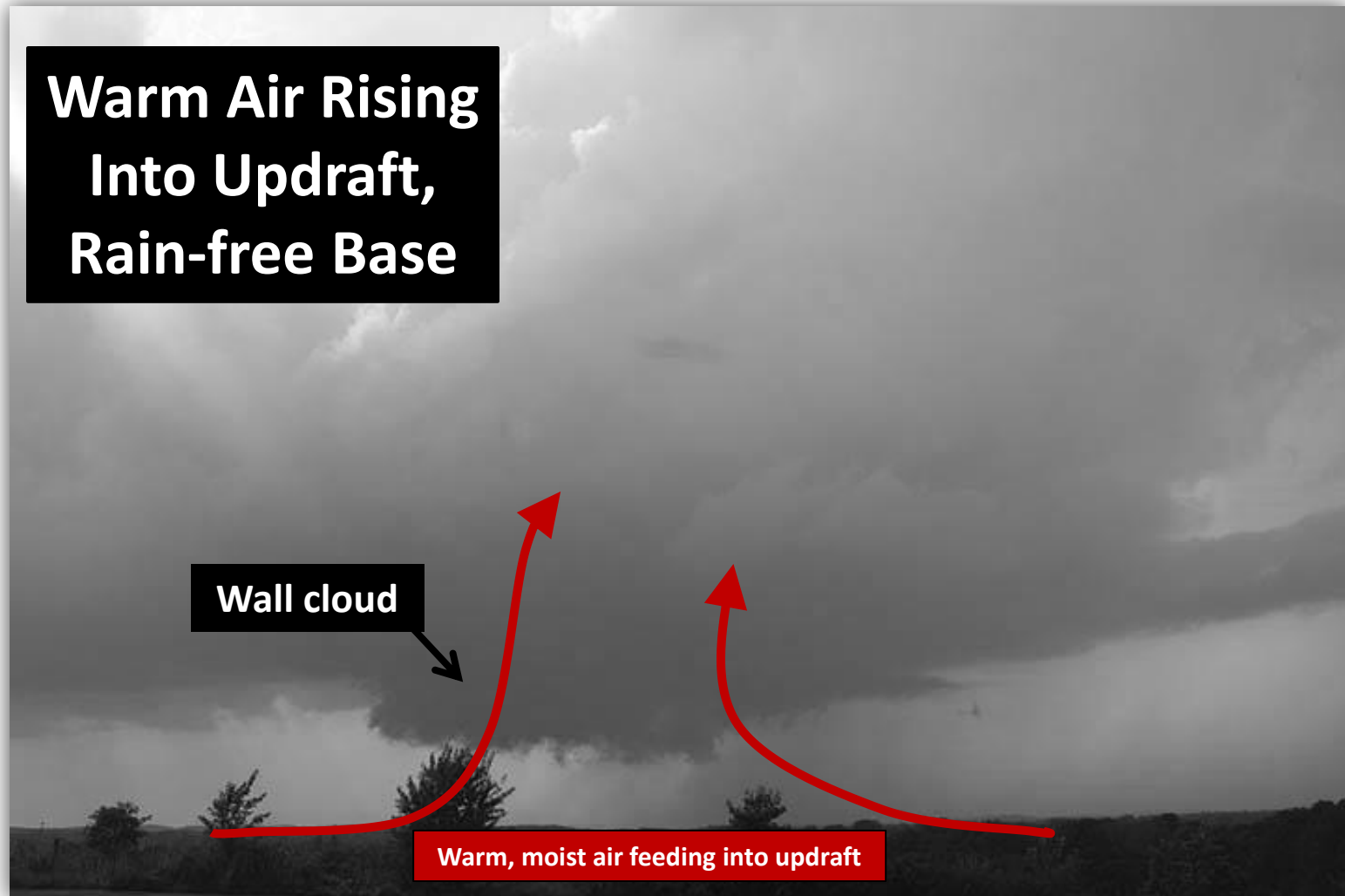
- Who we are, and why we need spotters?
 - Severe weather definitions
 - What and how to report
 - Safety in storm spotting
- Break--

Part II

- Thunderstorm development and thunderstorm types
 - Mesocyclone
- **Wall Clouds vs. Shelf Clouds; Scud Clouds and Tail Clouds**
 - Tornado formation
 - Report what you see; photo polls
 - Spotter information recap; polls

Wall Cloud – Inflow Winds

Located Underneath the Mesocyclone



Wall Cloud – Characteristics

- Surface-based inflow under the updraft, mesocyclone
- A localized, persistent and attached lowering of the cloud from the storm's rain-free base
- Normally found on the south or southwest (inflow) side of the thunderstorm
- May exhibit rapid, upward and downward motion as well as rotation; however, **not all wall clouds rotate**
- Often slopes or points toward precipitation or downdraft area
- Most do not produce a tornado



Shelf Cloud – Outflow Winds



Shelf Cloud – Characteristics

- Marks the leading edge of the gust front
- Usually produced by rain-cooled air
- Usually in an area of low-level shear
- Slopes away from precipitation area
- Often associated with a squall line and is typically associated with damaging, straight-line wind
- You will often see many turbulent eddies on the edge of, or underneath, the shelf cloud. This turbulent motion is not associated with anything tornadic!



Wall Cloud vs. Shelf Cloud Recap

Very Important!

	<u>Wall Cloud</u>	<u>Shelf Cloud</u>
Associated with the Updraft	✓	✗
Associated with the Downdraft	✗	✓
Often slopes toward the rain (downdraft)	✓	✗
Slopes down away from the rain (downdraft)	✗	✓
Often associated with funnel clouds and tornado	✓	✗
Favored area for rotation	✓	✗

Scud Clouds

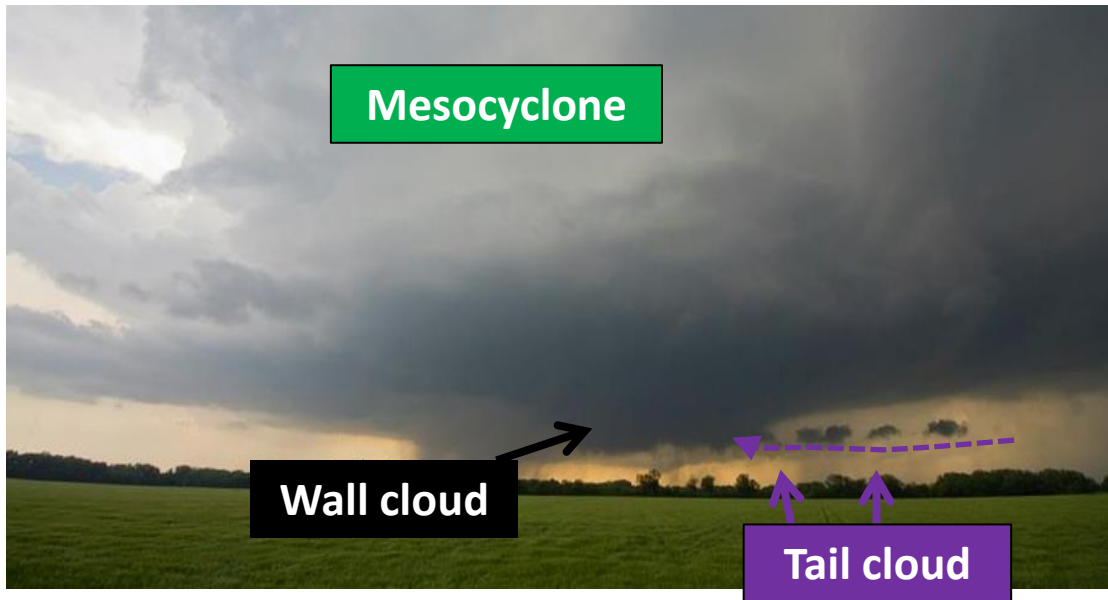
- Cloud fragments that are unattached, or rising into the storm's base
- Mainly signal wind blowing out of the storm; an interaction of cold outflow and warmth ahead of the storm
- They do not rotate; thus, not a funnel cloud, not a tornado – harmless!

Depending on the situation, rising scud clouds can organize to form a wall cloud at the storm's base. In this case, watch for further development and rotation.



Tail Cloud – Inflow Winds

Tail Cloud = inflow feeding into the [wall cloud](#)



Some of these inflow bands may develop quite close to the ground
Don't get tricked – not a Funnel Cloud, not Tornado!

Spotter Training Agenda

Part I

- Who we are, and why we need spotters?
 - Severe weather definitions
 - What and how to report
 - Safety in storm spotting
- Break--

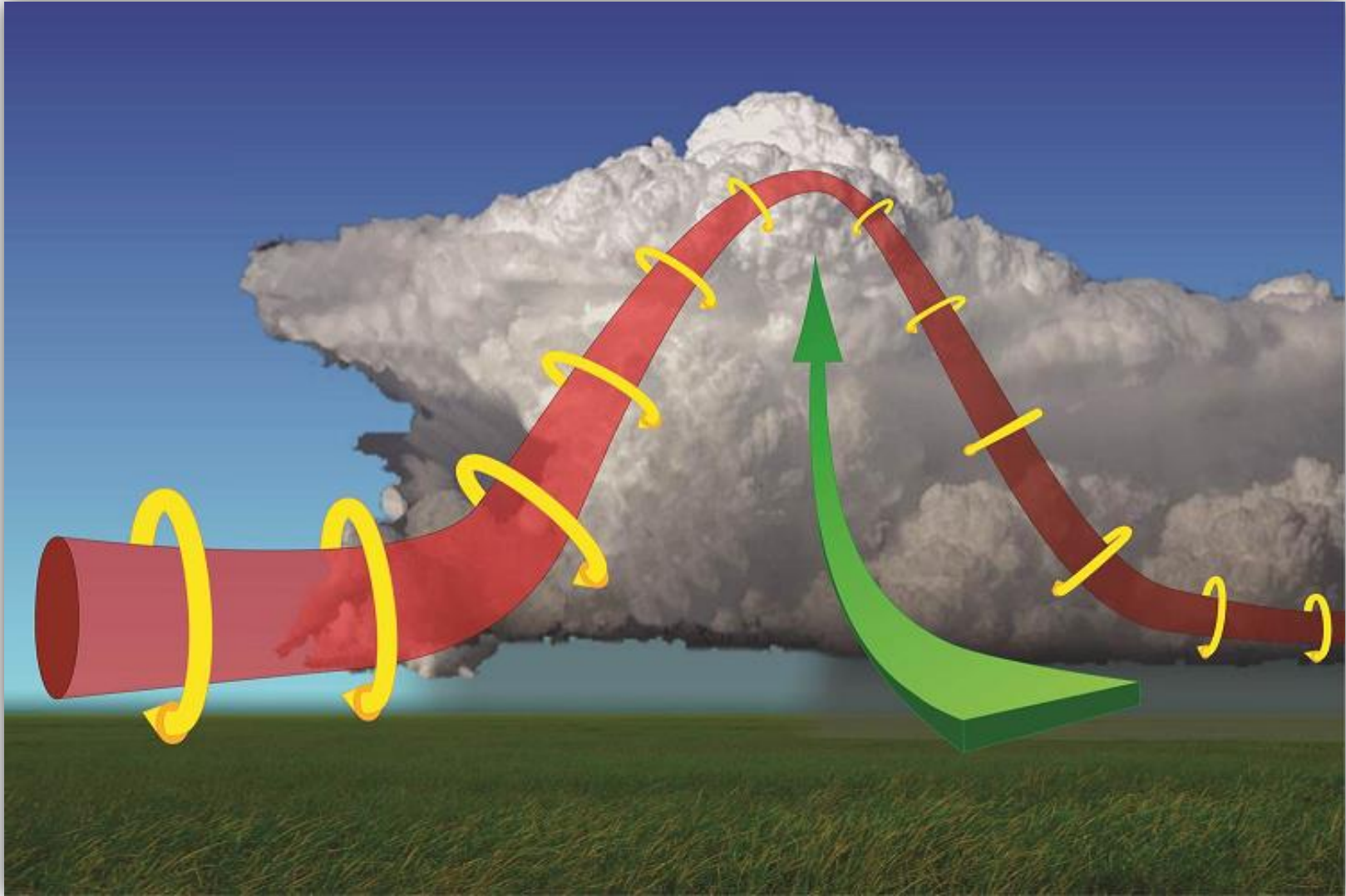
Part II

- Thunderstorm development and thunderstorm types
 - Mesocyclone
- Wall Clouds vs. Shelf Clouds; Scud Clouds and Tail Clouds
 - **Tornado formation**
 - Report what you see; photo polls
 - Spotter information recap; polls

Tornado Formation I



Tornado Formation II



Tornado Formation III



Funnel Cloud Develops

- A rotating, funnel-shaped cloud extending downward from a thunderstorm base
- Most often laminar or smooth in appearance
- Usually located near the updraft
- Attached to cloud base
- Funnel clouds do not reach the ground!



Then (maybe), Tornado!

- A violently-rotating column of air extending from cloud base to the ground
- The condensation cloud (part of the tornado, funnel you can see) may not extend all the way to the ground, but any debris kicked up along the ground indicates contact!
 - We'll go over examples



Wall Cloud -> Tornado Evolution

Wall Cloud



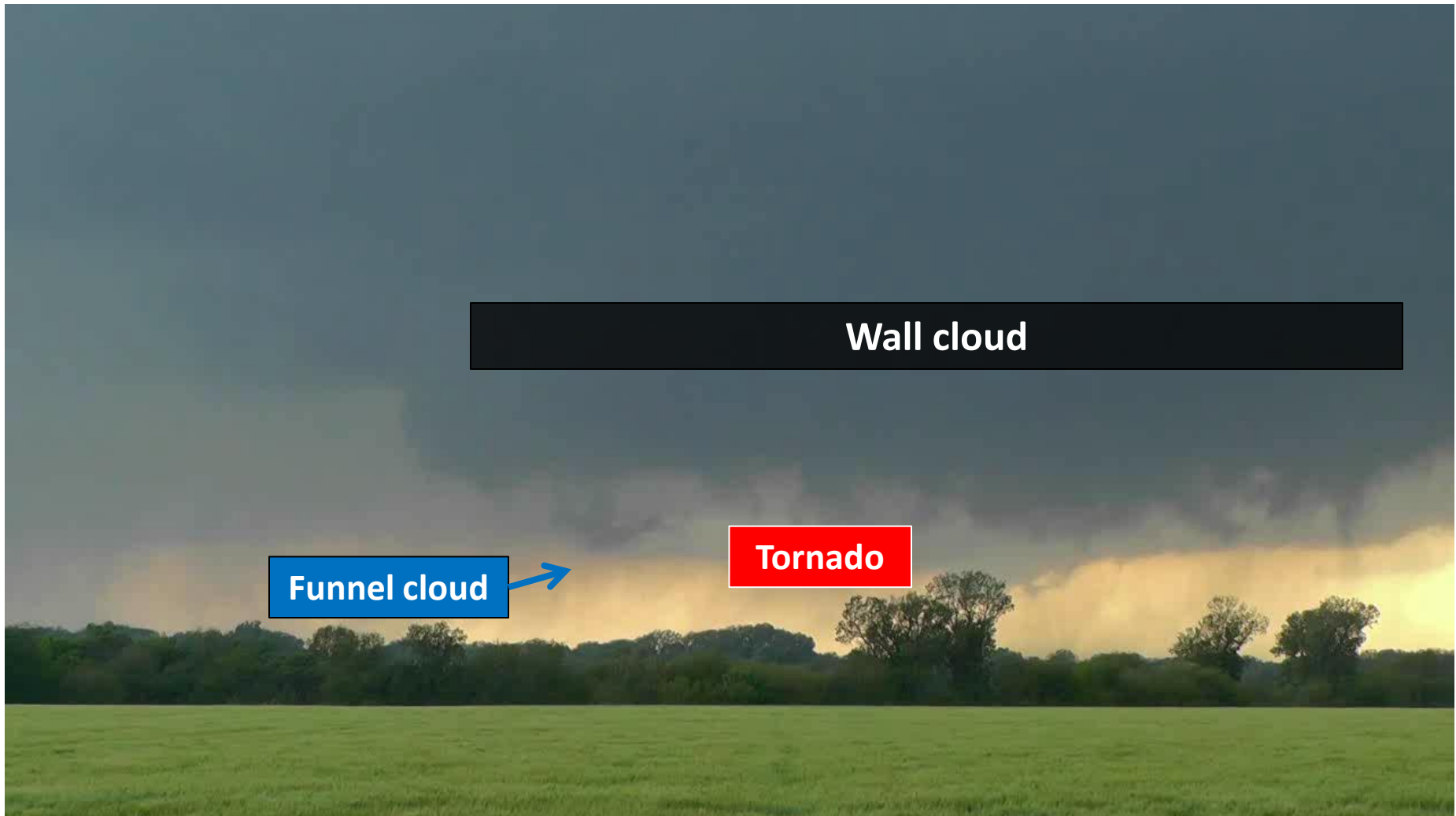
Funnel Cloud



Tornado



3-minute Wall Cloud -> Funnel Cloud -> Tornado Video Evolution



Tornadoes Vary in Size, Shape



EF Rating	Wind Speeds	Expected Damage	 95	
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.		
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.		
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.		
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.		
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.		
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.		

Spotter Training Agenda

Part I

- Who we are, and why we need spotters?
 - Severe weather definitions
 - What and how to report
 - Safety in storm spotting
- Break--

Part II

- Thunderstorm development and thunderstorm types
 - Mesocyclone
- Wall Clouds vs. Shelf Clouds; Scud Clouds and Tail Clouds
 - Tornado formation
 - **Report what you see; photo polls**
 - Spotter information recap

Report what you See! ₁



Answer: Tornado

Report what you See! ₂



Answer: Wall cloud

Report what you See! ₃



Answer: Quarter-size hail

Report what you See! ₄



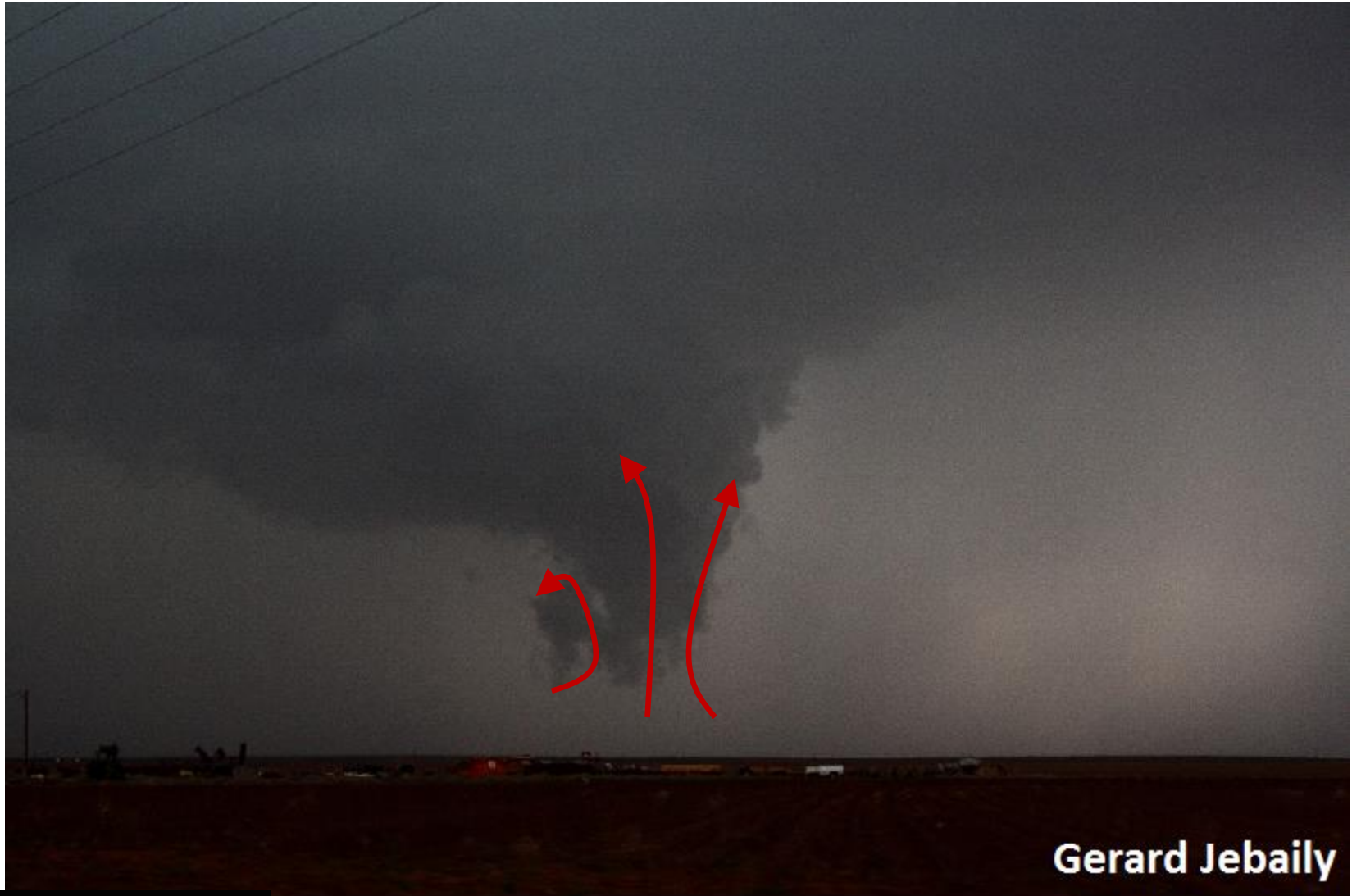
Answer: Funnel cloud from this vantage point , but could be a tornado – get a better view!

Report what you See! ⁵



Answer: Funnel cloud

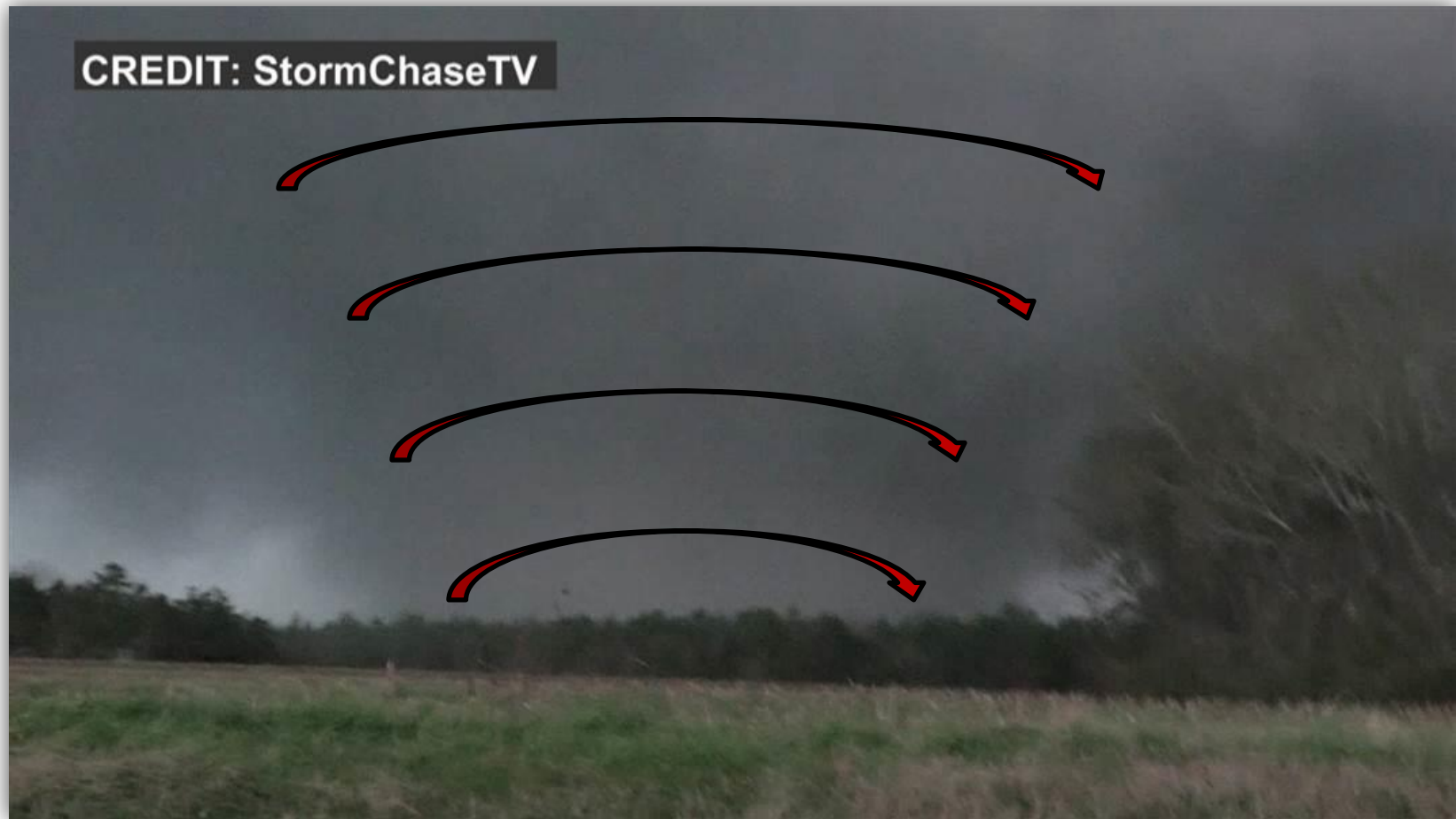
Report what you See! ₆



Gerard Jebaily

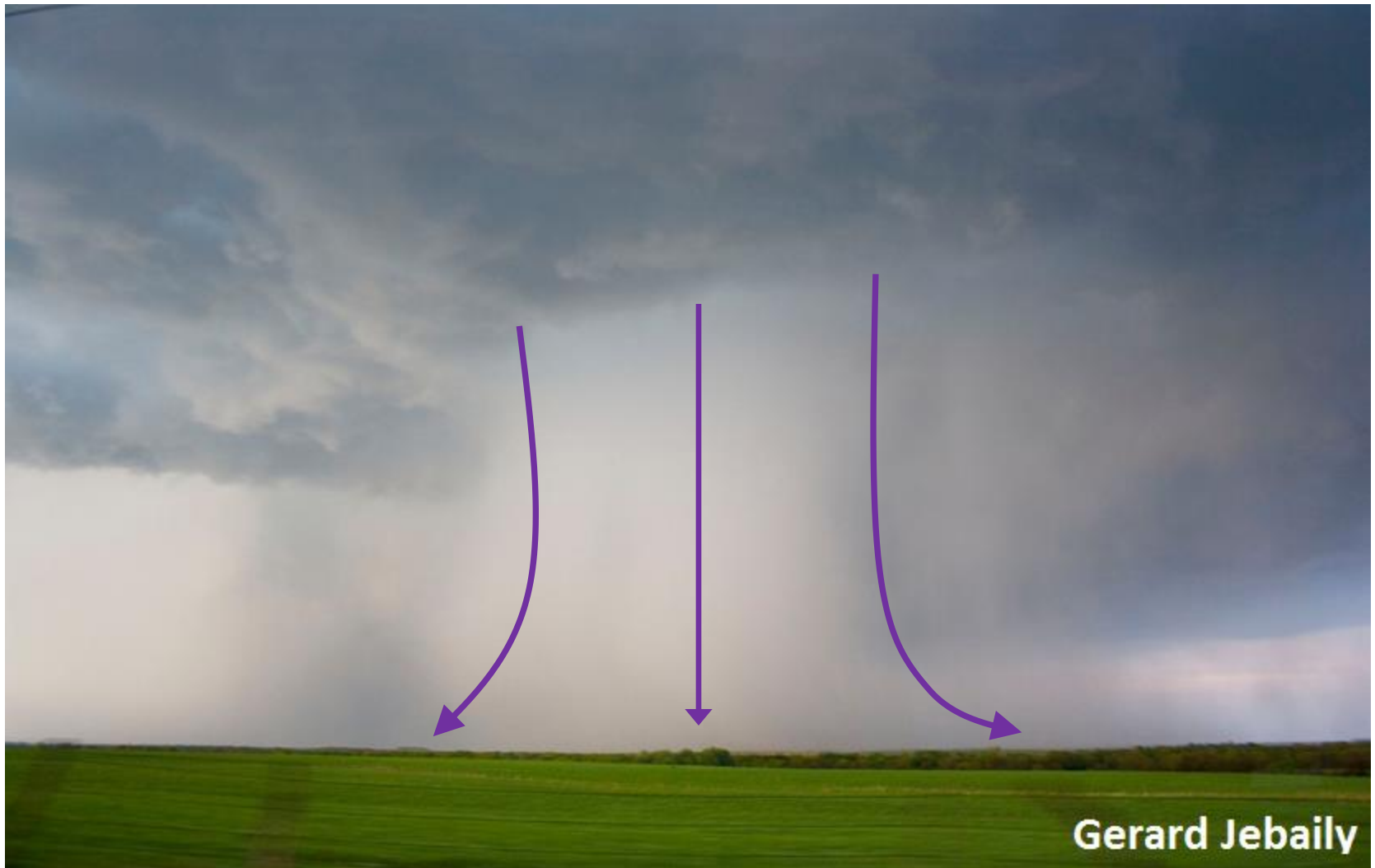
Answer: Scud cloud

Report what you See! ,



Answer: Tornado, let us know it's large as well

Report what you See! ₈



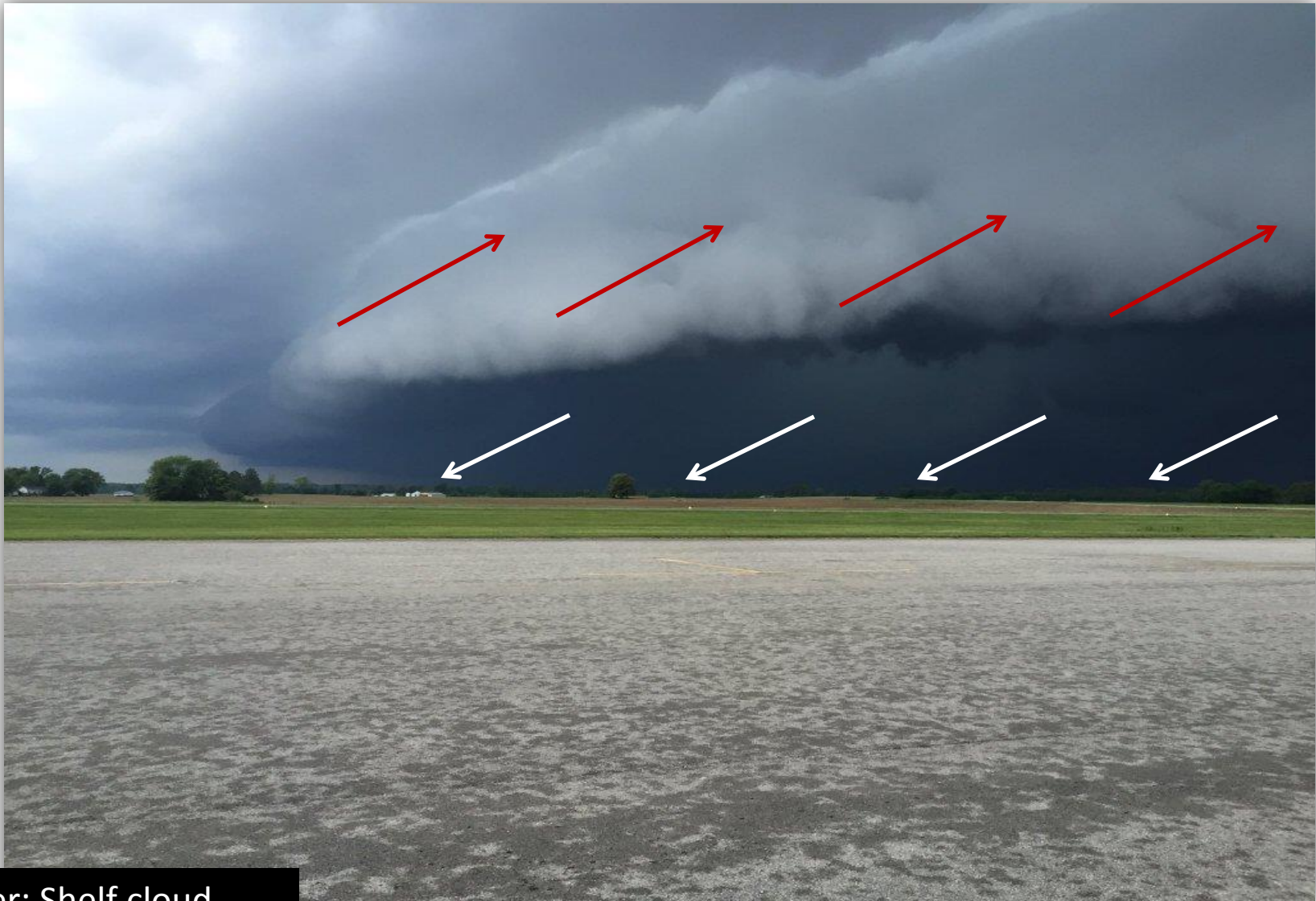
Answer: Rain shaft. You don't need to report rain to us, however

Report what you See! ₉



Answer: Tornado. Check out the 2 vortices along the ground

Report what you See! ¹⁰



Answer: Shelf cloud

Spotter Training Agenda

Part I

- Who we are, and why we need spotters?
 - Severe weather definitions
 - What and how to report
 - Safety in storm spotting
- Break--

Part II

- Thunderstorm development and thunderstorm types
 - Mesocyclone
- Wall Clouds vs. Shelf Clouds; Scud Clouds and Tail Clouds
 - Tornado formation
- Report what you see; photo polls
 - **Spotter information recap**

Final Key Reminders



108

- **Know your weather terms:**

- **Wall cloud:** a low-hanging 'blocky' cloud under the storm's updraft. Some wall clouds rotate and others do not. If rotating, watch for possible development of a funnel cloud and tornado.
- **Tail cloud:** A low-hanging cloud that angles/feeds into the wall cloud. They are not dangerous, though they may form low to the ground.
- **Scud clouds:** fragments of clouds hanging beneath the storm's base. They may be rising into the storm, but do not rotate and are harmless. They may collect to form a wall cloud if under the updraft, so keep watch.
- **Funnel cloud:** a rotating, funnel-shaped cloud descending from the base of a thunderstorm.
- **Tornado:** a violently rotating column of air in contact with the ground.
- **Shelf cloud:** a low, horizontal cloud associated with a storm's cold outflow. You may see turbulent motions along the shelf cloud, but do not mistake this for something tornadic. Straight-line winds are the threat.

When you spot these, are they located in the correct part of the storm? Be sure before you report!

Final Key Reminders

- Know severe thunderstorm criteria
 - Winds of 58+ MPH; and/or
 - Hail 1 inch, or more, in diameter

*A tornado also makes a storm severe, but triggers a Tornado Warning
- **Stay calm and be safe**
- **Pass along your reports to the NWS**
 - Even if not severe; <1" hail, funnel cloud, wall cloud, etc.
- **Do not exaggerate your report**

Final Key Reminders

- **Personal safety is the primary objective of every spotter**
- **Adhere to the concept of ACES at all times**
Awareness-Communication-Escape Route-Shelter
- **Obey federal, state, and local laws; directives from public safety officials**
- **Never put yourself in harm's way**
- **Remain aware of the weather situation around you!**



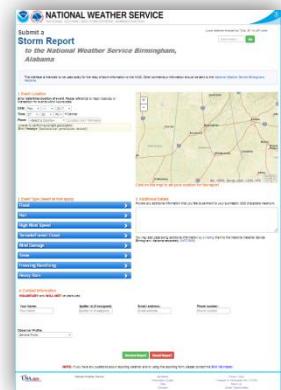
Reporting Options Recap

- Call the NWS office: 205-664-3010, option 2
- Social media: Twitter, Facebook
- Our webpage: 'Submit a Storm Report' page
- Photos of what you're seeing are great, too!

SR-BMX.Pix@noaa.gov

- Snapshot of a funnel, wall cloud, flooding, etc.
- Hail, wind damage (trees, buildings, etc.)

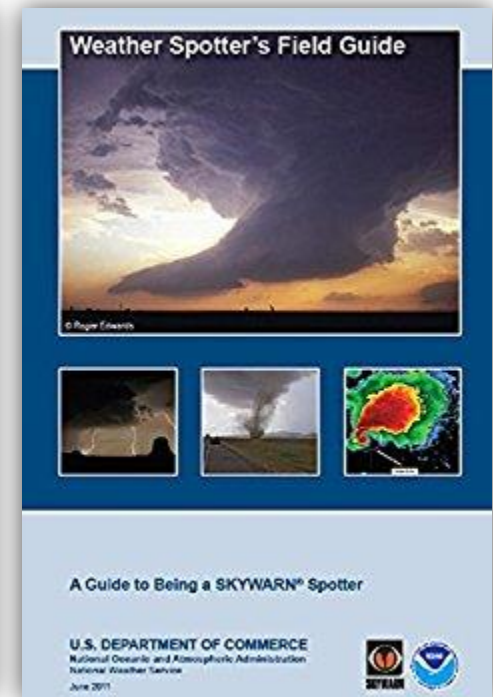
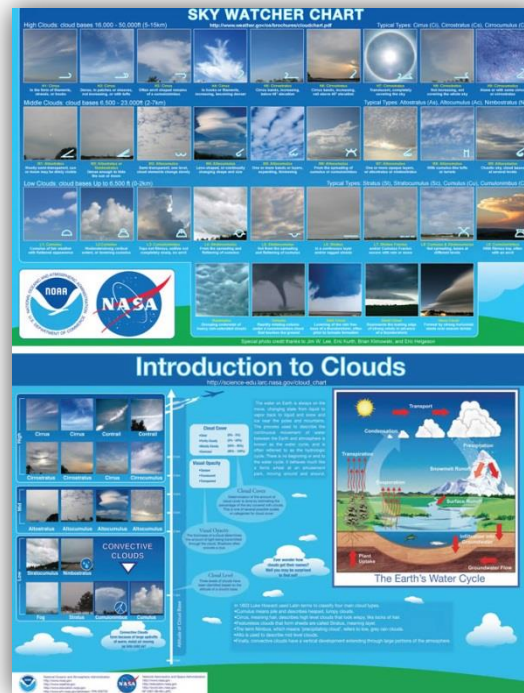
Don't use e-mail for urgent reports!



Additional Materials

Visit our Skywarn spotter page for useful links and information: weather.gov/bmx/skywarnschedule

- Spotter certificates
<http://www.weather.gov/bmx/spottertraining>
- Spotter schedule
- Training materials
- Brochures and guides



SKYWARN Basic Spotter Training

Gerald Satterwhite
Meteorologist

U.S. Department of Commerce
National Oceanic and Atmospheric Administration (NOAA)
National Weather Service (NWS) – Calera, AL

Questions, Suggestions, or Comments?
Gerald.Satterwhite@noaa.gov

We thank you for your participation!
Keep your eye in the sky!

